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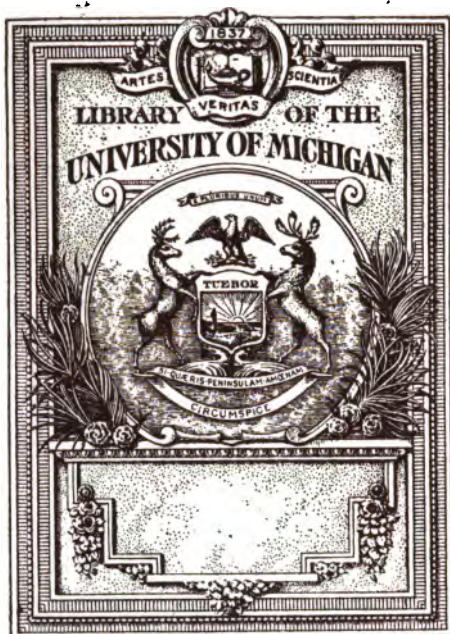
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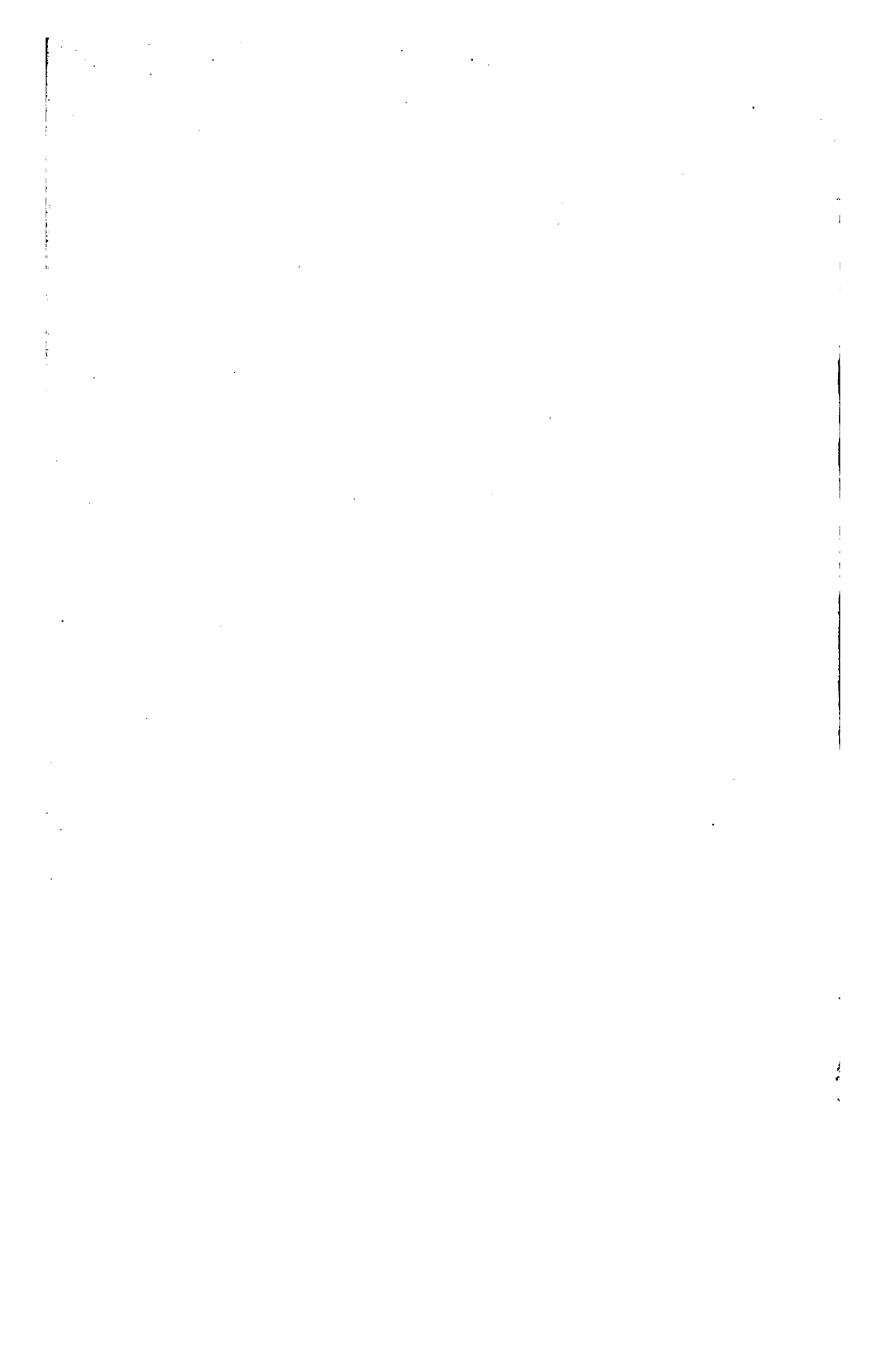
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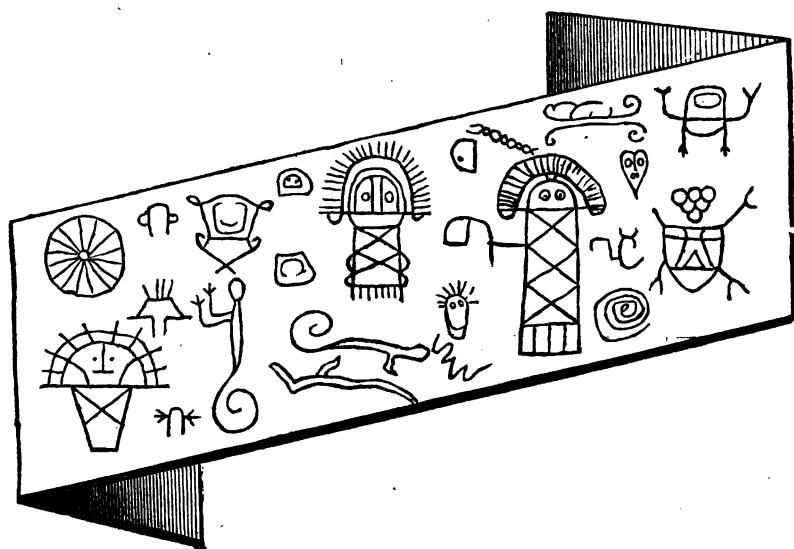
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## *Nesting of some Guiana Birds.*

*By C. A. Lloyd.*

**T**HE following short notes on the nesting of some of our birds are based for the most part on personal observations and partly on information obtained from Mr. THEODORE BARSHALL, a keen observer of Nature who has resided for over twenty years among the Indian tribes in the interior.

Unfortunately, in many instances noted, I have been unable to examine the nests at close quarters so that I cannot always record the number of eggs in a clutch, nor their colour.

Several of our birds resort to the nests of wood ants (termites), in which to deposit their eggs, among them being *Tityra Cayana*, one or two of the *Trogons*, and a small parrot, (*Brotogerys sp.*); others lay their eggs on the ground, in holes in the trunks of trees, and in the burrows of the paca and armadillo.

The large "Maam" *Tinamus subcristatus*, one of the commonest of our game birds, generally selects the bank of a small creek as the site for its nest, which it often places between the spurs of a Mora, *Dimorphandra Mora*. The nest simply consists of a slight depression

in the ground lined with dead leaves. The eggs, which number from seven to eight, are almost spherical in shape, and of a beautiful bluish-green colour, having the glossy sheen peculiar to the eggs of the Tinamous, a character which distinguishes them at once from other eggs.

According to the statements of many old bush men, this bird sometimes lays as many as ten eggs, but we never recollect having taken more than eight at one time.

Another of the Tinamous, the "Mamoo Swagger" of the "Bovianders," *Crypturus Variegatus*, makes no attempt at a nest at all but deposits its single egg on the ground at random. This bird seems to have no particular breeding season as its eggs can be obtained throughout the year. In colour they are deep chocolate, washed with pinkish violet, and are so curious that when once seen they cannot easily be forgotten. Unlike its larger congener which roosts on trees, the Mamoo Swagger passes the night on the ground, and is never seen to perch, in fact its small weak feet preclude its being able to do so. It is asserted that this bird occasionally lays two eggs, but as we have never met with an instance, most likely the eggs of another small Maam have been mistaken for it.

Some Indians once brought us four or five eggs of a delicate pink shade and about the size and shape of those of *Tinamus subcristatus*, but their contents had been badly extracted, and they were filled with maggots which had perforated the shell in several places, completely spoiling them as specimens. They were the eggs of one of the Tinamous, but of what species there was no means of ascertaining.

Of all our game birds the "Duraquara," *Odontophorus*



*guianensis*, seems to be the most prolific, as many as fourteen eggs being sometimes found in a nest, which, like that of the large Maam, is a shallow depression near to some tree root, having an arched approach of about a foot in length, formed by the bending inward of grass blades and twigs. The entrance to this is always carefully concealed, and the eggs, which are white, are about the size of those of a domesticated pigeon.

For a long time we could gather no reliable information concerning the nesting habits of the Warracaba, *Psophia crepitans*, some persons stating that all the females in a flock of these birds laid together in a common nest on the ground, others declaring they nested in trees and that the eggs were blue. At last we had the pleasure of taking a nest in the Savannah from a hole in the fork of a tree at a height of about twenty feet from the ground. It contained seven dirty white eggs, a trifle smaller than those of a common fowl, and as they were perfectly fresh most likely the bird had not finished laying her full complement.

A singular thing about the Warracaba is its dislike for young ducks which it always destroys when it finds the opportunity. I am told that it is impossible to rear ducks where any of them are kept.

The pretty little ground dove, *Chamæpelis passerina*, deserves mention for the peculiar habit it has of pretending to be wounded when it thinks its nest in danger of being robbed. The nest, which is small and flat, is usually placed on a low shrub or stump of a tree, and never contains more than two pearly white eggs. Should any one approach it, while the little bird is sitting on her charge, she immediately flutters to the ground and toddles

along with an unsteady gait, at the same time drooping one of her wings as if broken. This feint is evidently intended to distract the attention of any would-be enemy. The food of this dove consists chiefly of small seeds which it picks from low weeds on the ground. In the Islands the seeds of the Mexican poppy, *Argemone mexicana*, and the pink fruit of the "Turk's head" or globe cactus, *Melocactus communis*, make up its principal fare.

Two other members of the genus *Chamaepelia* occur in the colony. *C. talpacoti* is very common on the Savannah, but we know nothing of its habits.

One of the roughest of structures is the nest of the Powise, *Crax alector*, which is a platform arrangement, fixed in a tree and so loosely put together that its contents can be easily seen by anyone standing under it. The eggs of the Powise are white and larger than those of any other game bird. The shells are exceedingly thick and rough, looking as if they had been first gummed and then sprinkled with sand, or with the comfit known as "thousands," and allowed to dry. The Powise usually lays two eggs, but it is stated that this number is sometimes increased to four.

This bird has the odd habit of swallowing bright objects, such as pebbles of coloured quartz, and their gizzards often contain large pieces of the stone. We have seen pieces of bottles and small bits of broken sheet glass said to have been taken from the gizzard of one of these birds—a tame one most likely. The edges of the glass had been worn smooth by attrition.

The "Kiskadee," *Pitangus sulphuratus* and the "Pipituri," *Todirostrum cinereum*, are both remarkable for the manner in which they depart from the generality of the

*Tyrannida* in the construction of their nests. The nests of the Tyrant Shrikes are usually flat open structures, but the Kiskadee builds a large globular, and the Pipiturie a long purse-like nest in which to lay its two small white eggs. The former bird is the commonest of its family found in the colony. It lays three eggs spotted with blackish brown, the spots being concentrated towards the larger end. Young Kiskadees are often infested with the *larvæ* of a species of *Æstrus*, *Dermatobia noxialis*, known here as the "Mosquito Worm." At times these parasites are present in such astonishing numbers that it is difficult to understand how the birds can live to arrive at maturity. We have seen a young Kiskadee so infested with these disgusting larvæ that it was unable to close its wings, while its body was distorted to such an extent as to be hardly recognizable.

The Mosquito Worm also attacks the young of the red and yellow-backed mocking birds (*Cassicus affinis* and *C. persicus*.) Mr. BARSHALL informs me that these birds are frequently made the victims of another member of their family, *Cassidix Oryzivora*, which deposits its eggs in their nests, and imposes upon them the task of rearing its young. I have myself taken the eggs of this bird from the nests of the large black "Bunyah," *Ostinops decumanus*, but never could ascertain anything further concerning their history.

Most of our *Cassiques* resort to trees already occupied by colonies of wasps for the purpose of building their nests. I suppose this is for protective purposes, but then, why have not all of our birds developed the same habit? A marauding monkey or snake would be just as likely to

attack and rob the nest of a pigeon or dove as it would that of a *Cassique*.

The little Spine-tail, *Synallaxis cinnamomea*, or "Rootie" as it is called here, also builds its cumbersome nest in close proximity to those of wasps, and singularly enough, as if not satisfied with the protection afforded by these pugnacious neighbours, it invariably attaches a portion of the cast skin of a snake on the outside, possibly as an additional warning to its enemies. The eggs of the Rootie are dull white and usually four in number. Sometimes one or two strange bluish eggs are found with them, but no one seems to be acquainted with the bird to which they belong.

According to Mr. BARSHALL, the burrows of the Armadillo and Paca, *Cælogenys paca*, are resorted to by the Red-billed Barbet, *Monacha nigra*, as a nesting place. He has never seen their eggs, but all the nests examined by him have contained only two young birds. To the Caribesie Indians this Barbet is known from its cry as the "Ohekeeda," which means in their dialect, *I hav'nt got it*.

The seashore of the Waini Creek is one of the known breeding places of the Flamingo *Phænicopterus ruber*, in this country. The nest resembles a large yam heap, and is composed of vegetable substances thrown up by the sea. It is about two feet high and shaped like a truncated cone. The eggs are laid in August and have thick chalky-white shells. They are a little longer than those of a goose and seem to be from two to three in number.

With few exceptions the entire family of parrots lay their eggs in holes in the limbs and trunks of trees. Sometimes these holes are natural, while at others they

have apparently been excavated by the birds themselves, or are old woodpeckers' holes enlarged. Very frequently two different species of parrots occupy the same nesting tree and if the accounts of the Indians are to be relied on will even lay in the same nest.

Mr. BARSHALL states that he has seen on several occasions what he takes to be a hybrid between the "Screecher" parrot, *Chrysotis amazonica*, and the "Saurama," *Chrysotis farinosa*. Whether he is correct in his diagnosis of the species I am unable to say, but it appears to be certain that hybrid parrots are occasionally met with. While on this subject it is worthy of note that a very small form of the Screecher parrot is found on the Rupununi River. There is no difference in colour between it and the common *C. amazonica*, but the Rupununi birds are so much less in size that at first sight they appear to be a different species.

We know nothing concerning the habits of the little love-birds, *Psittacula sp.*, in their wild state, but in captivity they are very prolific, breeding all the year round and laying as many as four eggs at a time.

Although a common bird on the Savannah the nest of *Ara macao*—the finest of our Macaws—has never been seen by the Indians, who all agree in declaring its nesting place to be unknown.

On the other hand the blue and yellow Macaw, *A. ararauna*, breeds regularly in the trunks of old Eta palms and *Ara chloroptera*, the red and blue Macaws, on the tops of the tallest trees.

This last bird, Mr. BARSHALL informs me, often makes its nest at a very moderate height from the ground, so that it can easily be reached by climbing, but in the Savan-

nah it always selects the highest trees for the purpose.

There is a legend among the Indians that the Macaws have a King, who lives on "Makarapan," a mountain a little below the Macoushi Village of Anahi, and that all the Macaws retire thither annually for the purpose of moulting their tail-feathers.

The blue and yellow Macaw is known to the Macoushis as the "Cararawa" not "Warara" as was stated through mistake in a previous article entitled "Some Guiana Parrots."\* The name "Warara" should have been applied to *A. macao*.

It is a common belief both here and in the Islands that parrots with white tongues never learn to speak, and so far as I am aware this observation is correct.

Decaying Eta palms are the nesting places of *Ara hahni*, and the wild Muscovy Duck, *Cairina moschata*, which the Indians call by the rather pretty name of "Miwah." This duck is notable for the great disparity in the size of the sexes, the male bird being often nearly double the bulk of his mate. The complement of eggs is stated to be from eight to ten. When the young ducks are hatched, the mother bird is said to convey them in her beak to the nearest water.

The Silk Cotton is the favourite tree of the Jabiru, *Myiateria americana*, and the Harpy, *Thrasaetus harpyia*. Both of these birds return yearly to the same nest to breed. I have never seen the eggs of the Harpy, but the Indians relate that their nests generally contain two young ones, and most probably this is the number of eggs.

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\* See *Timehri* Vol. IX, N.S. 1895, Page 275.

in a clutch. The Kanaku mountain range seem to be their chief breeding quarters on the Savannah.

The Harpy preys largely on sloths and baboons, *Mycetes seniculus*,—especially on the former—and the ground about the nesting tree is sometimes literally strewn with the bones and hair of these animals.

The little Scops Owl, *Scops brasiliensis*, is also a common Savannah bird. There appear to be two distinct varieties of this little owl—one very dark and the other a light brown. This phenomenon in Zoology is known as *dichromatism* and is one of the most difficult problems to solve. It would seem that neither climate nor locality has much to do with it, since both varieties are met with on the Savannah.

The Scops Owl breeds in holes in trees and is said to lay from one to two eggs.

Most of our birds begin laying in May and June, but some have no particular breeding season. On the Savannah the Cock-of-the Rock, *Rupicola crocea*, lays in March, the large white Egret, *Ardea egretta*, and the Hunurie, *Ardea cocoi*, in June. Both birds lay light blue eggs, those of the Egret being somewhat more pointed than those of the Hunuries. The Eta parrot, *Ara hahni*, lays in December and January, *Tityra cayana*, in December, and, according to the Indians, the Boat-bill, *Cancroma cochlearia*, in March. I have never seen the eggs of the last mentioned bird. It is known to the Macoushie Indians as the "Warapapa."

Mr. D. E. MACKINTOSH, who has paid much attention to the Coast birds of Surinam, asserts that the scarlet Ibis or Currie-Currie, *Eudocimus ruber* never builds a nest of any sort, but takes forcible possession of those of the small white Egret, *Ardea candidissima*, for the purpose

of depositing its eggs. He states that he has often witnessed this Ibis in the act of tumbling the young Egrets out of their nests.

The small Egret breeds in vast "rookeries" along the sea-coast, and Mr. MACKINTOSH has seen several square acres of low Courida bushes dotted with their nests. During the breeding season large numbers of young Egrets fall a prey to the black Carrion Vulture, *Catharista atrata*, which may be seen hovering around the breeding grounds, on the look out for a chance to swoop down on some unguarded nest and carry off its contents. The old birds vigorously defend their nests against the attacks of the Vulture, but as the scarlet Ibis appears on the scene, they immediately desert their charges and fly away.

The eggs of the scarlet Ibis are three in number and very variable both in shape and markings. Usually they are spotted and splashed throughout with reddish-brown, but sometimes the markings are thickly distributed towards the larger end, where they often become confluent and form a large circular blotch. In shape, some of the eggs are markedly elongate and others quite oval.

The small Egret makes a very frail platform nest of twigs, and its eggs, which are of a dull pale blue colour, are a little larger than a pigeon's. Their breeding season in Surinam is in the months of February and March, but in this country it is said to be from July to August; possibly there may be two seasons in the year.

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## *Early English Colonies in Trinidad.*

*(Concluded)*

### THE DESCRIPTION OF TRINIDAD.

*(Sloane MSS. 3662, British Museum.\*)*

**T**HIS Island is scittuate between the degrees 9 and 10 of Northerne Lattitude, and between 320 and 321 of Longitude, counting from y<sup>e</sup> first and sixt Meridian of St. Michael's; one of y<sup>e</sup> Azoras Islands; and distant from the mouth of y<sup>e</sup> River Oro-noque, twenty leagues North, its East end from Barbados fifty 8 leagues South-south-West; halfe a point Westerly. Its Lenth is fourty leagues, East and West in circumference 120 English leagues, and is the largest of all the Carrebe Islands.

This Island was first discovered by COLLUMBUS, Anno 1497 (8) in his Voyage from Cales, for his further discovery of y<sup>e</sup> West Indies, who sayling from thence to the Westward, through that narrow passage between a

\* The author of this manuscript was Major John Scott, a Soldier-Planter of Barbados. He was appointed on the 29th of August 1668, to be the King's Geographer. Of his chequered career much information will be found in the Bodleian Library, at Oxford, in *Rawlinson MSS. A 175; A 178 and A. 241*. He seems to have been a thorn in the flesh of that curiosity of Humankind, Samuel Pepys, of Diary fame. Whatever Scott's personal character may have been, he possessed an accurate knowledge of the English settlements in the West Indies, and the whole of the *Sloane MSS. 3662* is a valuable contribution to the early History of Barbados, Trinidad, Tobago, Grenada, and Guiana.

pointe of the maine land, and this Isle, named it for its dangerousness, Bocca del Drago.\*

This Island is in figure something Triangular and devided into three parts, by 3 distinct nacions of Indians, vizt. The Carrebees, the Sapoyes, and Arowayoes, and those divisions are distinctly sepperated, into three parts,

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\* On Thursday the 31st of July 1498, Alonzo Perez, a mariner of Huelva, went aloft, upon the maintopsail of the Admiral's ship, and suddenly saw land towards the South-west, about fifteen leagues off. The land seen was in the form of three lofty hills. This was in the way of a coincidence, for Columbus, who was navigating in the name of the sacred Trinity, had already resolved to give the name *Trinidad* to the first land he should discover. The sailors sang the *Salve Regina*, and other pious hymns, in honour of God and "Our Lady." Columbus now shaped his course for Trinidad: making for a Cape, which, from the likeness of a little rocky islet, near it, to a galley in full sail, he named *La Galera*, but which is now called Cape *Galeota*. He arrived at Cape *Galeota* "at the hour of complines." Not finding the port sufficiently deep for his vessels, he sailed on Westwards. On the 1st of August he continued on his Westerly course, and came to deep soundings, somewhere near Point *Alcatraz*, where he brought to, and took in fresh water, of which he was in sore need. On the 2nd of August, he sailed on to the Westward, along the Southern part of *Trinidad*, to the Westward point, which he called *La Punta de Arenal*. Hence he beheld the Gulf of *Paria*, which he called *La Balena*, (the whale). Entering the Gulf by the *Serpent's Mouth*, just after the rainy season, his vessel was carried, on the conflicting waters, so as to alarm even the stout-hearted Admiral. "Even to-day I shudder lest the waters should have upset the vessel, when they came under its bows," wrote Columbus to Queen *Isabella*. As he moved up the Gulf, the Admiral called the mainland to his left the island of *Gracia*. The name of *Paria*, he found already in use, when he reached that place. *Aguja*, or *Needle Point*, was so named by Columbus. The Admiral sailed out of the Gulf by the *Dragon's Mouth*. *The Spanish Conquest in America*: by Sir Arthur Helps. Vol. II, pp 100 to 106.

by ridges of mountaines; and 'tis probable for these reasons it had its name.\*

This is a most fertile Island, hath severall fresh Rivers, and the accommodation of many excellent springs, and from the abundance and quallity of its woods and trees, the most excellent in all the world, might bee made great advantages, from some of them, issuing very rich Gumms, from others rich oyles, balsome and Odoriferous rossins, abundance of woods, proper for dyes. The very mountains covered wth. large cedars, white wood, and excellent timber for building, or sheathing of ships, especially in those parts of the world, where the worme eats both oake and firre, wch. in regard of ye bitterness of the timber, they forbear doing injury, divers yeares abundance of excellent timber, for joyners use, for Cabinets, and all other kind of rare workes.

The Cocoa, groweth heere in great plenty, and the best of the sort, in all the Indies, cotton and sugar-canes growe there very well and the Tobacco† of Trinidada is ye the best in the knowen world, from some of the

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\* See Sir Walter Raleigh's account of the distribution of the Indians, or 'Naturals' of Trinidad, as extracted in Section 16, *Supra*.

† This praise of the quality of Trinidad Tobacco would seem to justify the opinion of those who hold that it is to Tobacco of that Island that reference is made when Captain Bobadill says :

*'Tis your right Trinidado.*

*(Scene 2 of Act III, of Every man in his humour.)*

In the context, however, Ben Jonson seems to have had Cuba, or San Domingo in his mind. When Bobadill asks for his match, Cash exclaims:

*Would his match and he and pipe and all were at Sancto Domingo,*  
To distinguish Trinidad-de-Cuba from the Island, the Spaniards added the word *Barlovente*, to the name of the latter.

Mountaynes issues out great quantities of Tarre,\* some black, other green and yellow, and the very cliffs towards the sea are stored w<sup>th</sup> a sort of Munjack, not much unlike pitch, to the eye, w<sup>ch</sup>. serves very well for trimming ships, there is great store of sulphur on some of the mountaines, and other symtomes of rich mines.

For the time of its being first inhabited, know y<sup>e</sup>. one DIDACUS A CAMPUS, and some other Spaniards, between the yeares 1522 and 1590, attempted to settle this Island, but were expelled by the natives ; who though of different nations, had a sence of the Spanish cruelty, and were unanimous against so severe an enemy. *Untill* I know not upon w<sup>th</sup>. occasion, otherwise than a common fate, that at certaine periods of time had attended most nacions in the world, had then a concurrence to their destruccions, for about the yeare 1587, the Carrebes and Arawagoes had great differences in the West Indies and particularly on Trinidad, where the Nepoyes or Sapoyes nation (for they call themselves by both those names) abetting y<sup>e</sup>. Abrawacoes by w<sup>ch</sup>. meanes abundance of the Careb nacions were destroyed and the Arawacoes and Nepoyes strangely wasted. This gave the Spaniard an opportunity of settling on this Island w<sup>ch</sup>. united the Indians, and OVIDO in his History of y<sup>e</sup> West Indians is of opinion had not the King of Spaine, in time, employed that excellent Soldier DON ANTONIA DE BERERO,† a most judicious gentleman, the natives would have rooted them out of their new Colonie w<sup>ch</sup>. was only one small

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\* For Raleigh's mention of the Pitch Lake and Schomburgk's *Note*, See 17, *Supra*.

† Mention of Berreo ; or Berrio, as the Spaniards spell the name, will be found in Sections 5, 6, 8, and 19, *supra*.

Cittie, consisting of about 500 houses, in the bottom of y<sup>e</sup> grand bay upon the river Carone, wch. the founder named ST. JOSEPHS, this DON ANTONIO the Governor, soe devided the Indian in blowing up the coales of the former differences, wch. he did by the accommodation of a Fryer that had lived at the Island Margaritta and had some judgment in their language and manners, by wch. meanes the Spaniard greatly depopulated the Island and in less than two yeares gave lawes to those native inhabitants, and subjected them to the Spanish Yoake.

Anno 1594, Sir ROBERT DUDLEY,\* undertooke a voyage into y<sup>e</sup> West Indies, and sayled first to Cape Blanco in Africa, where making little stay ordered the master of his ship and pilot of the fleet one Mr. ABRAHAM KENDALL, to direct his course to y<sup>e</sup> Island Trinidad where he arrived from the s<sup>d</sup>. Cape in two and twenty dayes, and although he designed to fall upon the Spaniards, yett such was the power the Spaniard had over the natives that he could not learne the strenth of the Spaniard untill he discovered the succourse the Spanish Governour had gotten from Comona and Margaretta, wch. were made knowne to him, by five Indian Captaines, of the Nepoyes and Arawaco nations which y<sup>e</sup> Spanish Governor came afterwards to understand, by one of their servants, wch. he catched and extracted the secrett from him by torments; and soone after decoyed the said Captaines into his Fort, and kept them all in one chayne, where Sir WALTER RALEIGH found them the yeare after,

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\* Particulars of Dudley's visit to Trinidad will be found in Sections 10 to 15, *Supra*.

and released them,\* **SR. ROBERT DUDLEY** perceiving his hopes of Trinidad bootlesse directed his cource first to the maine land South-west from point d'Brea or Pt. Pich, on Trinidad, and from thence dispatched a Company of Soldiers in small Boates up y<sup>e</sup> river Oranoque, on a discovery for gold mines, they wandered up and downe fourteen days or there abouts, and returned to the fleet, makeing little discovery; and **SIR ROBERT DUDLEY** sayled over againe to the River Parracoa, on Trinidad, where he watered, and tocke in soome fresh provisions, and fruits, and sayled thence first to the island Granada, and then to St. John, Portarico, and other parts of the Indies, where hee did the Spanyards great damage, and during his stay at Trinidad, did make some progresse in the Arawaco language. **SR. ROBERT DUDLEY** had not been gon from Trinidad, above two months but there arrived from England, at y<sup>t</sup> Island **SR. WALTER RALEIGH**,† wth. a small fleet of her Maties. ships; who first anchoring within point Galeria, the east point of y<sup>t</sup> Island, he did wth. his barge, from the said east point, row by the shoare into every Bay, Cove, River, and Creeke, untill he came to the point wth. in y<sup>e</sup> grand Bay, called Punta de Brea, or point Pitch, (wch. is noe less than 170 miles by the shoare) where the whole clifts are that kinde of Pitch, called in y<sup>e</sup> West Indies Munjack; **SIR WALTER**

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\* See Section, 18, *Supra*.

† An account of Raleigh's first visit to Trinidad will be found in Sections 16 to 21, *Supra*. Details of his second visit to that Island will be found in Section 28, *Supra*. Edwards, in his admirable *Life of Sir Walter Raleigh*, quotes from a Manuscript, preserved in the Library of Corpus Christi College, Oxford, 297, B, 2, 2, ff. 160. This is a *Narrative*, by Jones, the Chaplain of the *Flying Chudleigh*, of the events of the second voyage.

RAWLEIGH at his Extraordinary hazzard and paines surveyed this Island; and it was long before they could come to the speech of any of the natives, soe strangely had the Severitie of DON ANTONIO, the Governor awed those people. At lenth one CONTIMAJ, an Arrawaco, Capt. and his slave seeing one Capt. WIDDON in Company wth. Sr. WALTER RAWLEIGH a gentleman the Indian had seen before at Oranoque in a small Corior\* or soe they call these small boates. This Arawaco gave Sr. WALTER RALEIGH an account of Sr. ROBERT DUDLEY'S stay on that Island, wch. had like to have been his ruine, the cruelty of the Spaniardes to the five Arawaco Captaines, that were friends to the English; of DON ANTONIO'S sending to Margaritta and Commana, for more Soldiers; upon his understanding who Commanded that Fleet, how far it was from the place where y<sup>e</sup> ships Roade at Anchor, to the Citty up the river Caroone, w<sup>th</sup> strenth they had, that DON ANTONIO resolved to give him a Cassada, if his strenth came from Margaritta, &c. and further assuring the English that all their Indians would assist them and that haveing expelled the Spanyard thence they could put themselves under the proteccion of his Great Mistresse the Queen, upon wch. Sr. WALTER RAWLEIGH fell upon the Citty, and by the assistance of the natives surprised it and suffered the Indians to burne the Citty, wch. did greatly oblige the Indians to him, and permitted the Spanish inabitants to transport themselves whither they pleased except the Governor. DON ANTNIIO DE BERREO, and his Lieutenant, whome Sir WALTER RAWLEIGH kept, but

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\* Cerial.

used wth. extraordinary kindness. The Governour beeing a gentleman well desended and of great gallantrie and curtesy ; an excellent soldier, one that had served the the King, his Master, both in Millaine and the West Indies wth. good successe.

St. WALTER RAWLEIGH, although he had a great opinion of Trinidada, yett his genius run greatly, after ye gold Mines, he fancied there was in Guiana (and soe ever after prosecuted yt designe into wch. cheat he was drawnd by ye Spanyard who ordered a ship of theires to cruize up and downe till shee met wth some of Sir WALTER RAWLEIGH'S fleet, and shee fortun'd to fall into the hands of one Capt. GEORGE POPHAM in wch. ship was divers pacquets wch. did give an account of a great cittie, they had discovered on Guiana where was the most incredible quantity of gold ever heard of, and ye dishes, plates, spoone, and all other Ucensills yt ye meanest people used were of gold, and this was attested by Seignr. ALONZO Governor. of Commona, an other signed by RODERIGO CARRANCA, register of the Army, a third signed by MARTINEZO, Secretary of Jamaica, on other pacquett from the Governor. and persons of quallity at Riodihacha, and from divers other parts of the Indies, and haveing suffered him to take such proofes, as they had fitted for that end, on designe to keepe Sir WALTER RAWLEIGH, from those parts, that were really rich, and in their possessions: for its certaine, there is noe such thing as the Citty Elrado, although the upper part of Guiana hath store of gold, but its found as in Guinney in small grains.

Wee find nothing considerable at Trinidada, untill ye yeare 1605, at wt. time ye Spanyard bought of some Dutch Merchants a quantity of Negroe Slaves to be de-



livered at y<sup>e</sup> River Carone on Trinidada being resolved to rebuild their Cittie St. Joseph, w<sup>ch</sup>. at y<sup>t</sup> time w<sup>th</sup>. the Indians, they could not doe for the Arrawacoes, Nepoyes and Carrebs, the Natives of Trinidada did unanimously owne the protection of the English and Sr. WALTER RAWLEIGH did instruct them in building a fortification, on the most naturell fastnesses, and to make them Musquett prooffe, whither their old men, wives, and children, might retyre,, in time of distresse, whilst they might gaule the Spanish Settlements. Hee likewise stored them w<sup>th</sup>. many thousands of Arrow-heads of hardened Iron, such as they never had before nor since. The Dutch Merchants sent their Negroes, by one ISAAC DUVERNE, who Anno 1606, landed 470 men and women, negroes, at Trinidada, and during his stay did converse much w<sup>th</sup>. the Indians, whome he reports to have had a Venerable opinion of Sir WALTER RAWLEIGH. This gentleman did travell many score miles on Trinidada, and doth report it to bee the best land he ever beheld, he saith there are in it rich copper and iron mines, sometimes (he saith) he found mountaines covered w<sup>th</sup>. Marquoysetts, very ponderous, That he travelled some Miles in one Valley, the earth whereof being fragrant as violets, and from the trees that grew on that land, there issued out the most odoriferous Balsome he ever smelt.

From DUVERNE'S observacions, Anno 1607, nothing hapned considerable for divers yeares, some little misunderstanding between the Spanyards, and y<sup>e</sup> native Indians and Sr. WALTER RAWLEIGH'S harbouringat Point Gallo or Cape Coast, on that Island, in his last and unhappy Voyage to Guiana, 1618, and his renewing his league, and acquaintance w<sup>th</sup>. the Indians.

In the yeare 1625, Cap<sup>t</sup> THOMAS WARNER w<sup>th</sup> 3 ships from London designed to attempt something upon the Spanyards at Trinidad, but it proved bootless, and after a short stay sayled thence to the Island St. Christopher's;\*

The yeare after, an English ship being in those parts

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\* What the something was that worthy Captain Warner designed to attempt upon the Spaniards, must be inferred. As a fact, a Warrant was issued on the 25th of January 1625, for *Letters of Marque* to Ralph Merrifield, a London Merchant, to set forth in warlike manner the Ship called the *Guifte of God*, of London, of the burthen of 40 tons. This vessel mounted 6 pieces of Ordnance, had 40 men, and was victualled for 12 months. Her Captain was Thomas Warner.

In 1624, Captain Thomas Warner founded English Dominion in the West Indian Islands, by making a settlement at St. Christophers, commonly called St. Kitts. Thence the Flag of St. George was carried to Nevis, Montserrat, and Antigua. He was Knighted at Hampton Court on the 4th of October 1629; and died at Saint Kitts on the 10th of March 1648. (Old Style).

Descendants of Sir Thomas Warner in the 10th and 11th Generations are to be found throughout the British Empire. Trinidad has for many years past been the Head Quarters of those Warners who dwell in the West Indies.

For some account of Sir Thomas Warner, and his Colonies in the Caribbee Islands, see

The Works of Captain John Smith, of Virginia and New England. [Arber's Edition, Birmingham, 1884]. pp. 898 to 980.

The *Relation of the first Settlement of St. Christopher's and Nevis* by John Hilton, Storekeeper and Chief Gunner of Nevis. April 29th 1675; and other Manuscripts among the collection in Egerton, 2,395, in the British Museum.

Lawrence Archer MSS. (Warner Pedigree), British Museum.

*Depositions and Pleadings in the case of the inhabitants of Barbados, vs. Earl of Carlisle, &c.* C. 94 in Rawlinson MSS., in the Bodleian, The Introduction to Sloane MS. 3662.

*Calendar of State Papers* (Colonial), *passim*.

*Chronological History of the West Indies*, by Thomas Southey. Vol. I, *passim*.

*Antigua and the Antiguan* (London), 1844). Vol. I, pp. 5 to 8; Vol. II, pp. 305, to 312.

*A Young Squire of the Seventeenth Century*. (Edited by John Cordy Jeaffreson).

See also, the French Writers *Du Tertre*, *Rochefort* and *Labat*.

of ye West Indies, fortun'd to fall in wth the Island of Trinidada, and wanting fresh water, did there supply themselves, and during their stay the Indians did shew them great kindness. and did likewise signifie unto them, that they kept the greatest part of yt<sup>e</sup> Island for the English, in pursuance of their compact wth Sr. WALTER RAWLEIGH, Anno. 1593; and renew'd wth the sd. Sr. WALTER RALEIGH, Anno. 1618. Was made knowne to PHILLIP, Earle of Pembroke, Lord CHAMBERLAINE of his then Maties. Household; by the Master of the Ship one. ROBERT GODDARD, at the returne of their Voyage for England upon wch. PHILLIP, Earle of Pembroke, having had a great pretence to all the Careebee Islands (the greater part of wch. were in the possession of JAMES, Earle of Carlisle) had a grant thereof, (as a full issue of all those troubles and differences that had been betweene the two Earles about Barbados, &c.), from his Majestie King CHARLES the First, by his Lettres Pattents under his great seale of England the 25th of February the Third yeare of his sd. Maties. reigne; did give, graunt and confirme, to the Right Hon. PHILLIP, Earle of Pembroke, and MONTGOMERY all and every the Islands of Trinidada, Tobago, St. Bernard, and Barbados, and by the same Letters Pattents did create the said Islands into one Province, and did ordaine the same to be called by the name of the Province of Montgomery, or Montgomery Islands, and amongst divers other Privileges and Immunities, did give and graunt thereby unto the sayd Earle of Pembroke and MONTGOMERY, his heires and Assyngnes full power and authority, to make wholesome lawes and ordinances, and to constitute, and ordaine officers of all sorts. and to Arme them wth authority and power for

the better Government of the sayd Province; in such manor as hee and they should think meete.\*

The sayd PHILLIP, Earle of Pembroke, etc., by an Indenture of bargaine and sale, beareing date the ninth day of Aprill, Anno 1638, bargained and sold unto ROBERT, Earle of Warwick, his heires and Assignes all and singular the said Mountgomery Islands, called by the severall names aforesaid, wth. all their Rights, Prerogatives and Privilliges, etc.†

#### THE FIRST COLLONIE.

ROBERT, Earle of Warwick, in order to the ends designed by his Matie, vizt: The expectacions of the English Monarchy, etc. Did first Commissionate Capt. ROBERT MARSHAM, Anno 1639, Lieut. Governor under his Lordship, of all the said Province of Montgomery,

\* 1628.—On February 25th, at Westminster. Grant to Philip, Earl of Montgomery, Lord Chamberlain, of certain islands between 8 and 13 degrees of North Latitude, called "Trinidado, Tabago, Barbudos and Fonseca," with the Islets belonging to them within 10 leagues of their shores, and all customary royalties and immunities, reserving a rent of a wedge of gold of a pound weight, when the King, his heirs, or successors shall come into those parts. Latin. [*Sign Manual, Car. I. Vol. 5, No. 22. See also Docquet 1628, Feb. 13. Domestic, Car. I.*]

1628.—Feb. 25. Abstract of Patent to Philip, Earl of Montgomery containing a grant as above, he having acquired those islands at great expense with the good intention to transport thither a colony of English.

1628.—Feb. 25. Minutes of the above. [*Colonial Correspondence. 1607, (p 1627) Jan. 9, and 1628, Feby. 11.*]

Calendar of State Papers—Colonial, 1574 to 1660. pp. 87, 88.

† Robert Rich, the 'Stout Earl' of Warwick of the Civil War, was a great promoter of Colonies. He received a Commission as Governor-in-Chief and Lord High Admiral of all the Plantations in America, in 1643, by an Ordinance of the Parliament. He proposed at one time to go out himself as Governor of Old Providence Island, off the Mosquito Coast.

This gentleman was murdered by ye Carebee Indians of Trinidad ; by the Contrivance of the Spanyard, who informed the said Carebees, that the English were come on purpose to assist and abett the Sepoyes, and Arawacoes, against them the said Carebees. The greatest part of this small Colonie were preserved by the timely assistance of the Arawacoes in-dispight of that Spanish contrivance.\*

#### THE SECOND COLLONIE.

Anno 1640. The said ROBERT, Earle of Warwick, did graunt full power to divers gentlemen, to plant a second Collonie and did Commissionate the said Gentlemen to chouse a President and name in the sd. Commission, divers persons for a standing Councell, but his lordship ye yeare after did resolve to Nullifie the power graunted as aforesaid. And in order thereunto did Commissionate one Capt. WILLIAM FORTESCUE to bee Governor and Chife Commander of the English Collonie at Trinidad but before the Arrivall of the said Commission, the people had elected one Major JEREMIAH HARTLEY; and was resolved they would not receive Capt. FORTESCUE, alledging, that would destroy the Privilliges graunted them from the Earle of Warwick

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\* Captain Marsham was killed at Tobago, according to Major Scott's account of the Settlement of that Island, given in the *Sloane MS.*, 3662. Therein he says (*folio 48*) of attempts to found Colonies on Tobago: 'The 9th of October 1639, one Captaine Massam, wth. between 2 and 3 hundred English attempted a settlement there, but, the Indians from St. Vincent's did strongly gaule them from time to time, pretending they were not the owners of it. Many of them murdered by the Indians; and Capt. Massam himselfe likewise dyed of ye wounds he received at Tobago. Those of his Colony left, sayled for Trinidad, and were there kindly received by the Arrawago Indians, 1640.

wh. were the grownds of their leaving their Native Countrie, and did send the Earle of Warwick, their reasons why they could not, in prudence receive the Governor (his Lordp. had sent them) wh. gave sattisfaction to his Lordship.\*

#### THE THIRD COLLONIE.

Anno 1644, (3?) the sayd ROBERT, Earle of Warwick,† for the encrease of the Honor and Extent of the English Nacion and for divers other good ends, did graunt divers liberties and priviledges; unto JOHN HOLMSTEAD, and THOMAS CHURCHMAN, of London, Collonels RICHARD BEATON, ALEXANDER PIARD, of the same, Serjant Majors, CHRISTOPHER KYNNEILL, EDWARD SMITH, RICHARD SANDERS, ALEXANDER JULIDAH, Esqrs. and Wm. BEDISMOUNT, FRANCIS REEVIS, JOHN FOUNTAYNE, JOHN GREEN, WM. TURKS, ROBERT KING,

\* On the 9th of March 1641, a Court for Providence Island was held at Warwick House, London. On the Minutes, was noted an order, that the master of the magazine ship, was to carry provisions to Trinidad, if Providence Island, off the Mosquito Coast, were not in safe hands: also, twenty barrels of powder and other ammunition. *Calendar of State Papers—Colonial*, 1574 to 1660. p. 318.

On the 28th of February 1642, Richard Norwood wrote from Bermuda to the Governor and Company of Adventurers to the Somers Islands. In his letter, Norwood mentions that many persons had gone from Bermuda with Captain Chaddock to Trinidad. *Calendar of State Papers—Colonial*, 1574 to 1660. p. 323.

Writing from Bermuda on the 17th of February 1670, John Dorrell, Senior, and Wentworth, confirm the above [*Calendar, Colonial*].

† On the 7th of June, 1643. Instructions were issued by the Earl of Warwick to Captain John Severn, Commander of the *Elias*, 400 tons, bound to the West Indies, for taking ships in the American Seas, by virtue of the King's Letters Patent, and as to the disposal of the goods seized. Captured negroes were to be left "at my island of Trinidad." *Calendar of State Papers—Colonial*, 1574 to 1660. p. 324.

EDWARD DYSON, SAMWELL LEADBEATER, THOMAS THEOBOLDS, BERNARD TREMBLETT, SAMWELL EAMES and THO. COOPER, Gent. for and in behalfe of themselves and their Associats, vizt. 100,000 acres of land, in any part of the said Island, or Isletts, within four leagues of the Grand Island (alwayes provided they were not to settle within twenty miles of the Collonie, already planted by Serjant Major HATLEY) wth. all shoares, ports, creeks, havens, harbours, rivers, and the soyles thereof, and all woods, lands, grounds, mines, mineralls, Structures, wild-beasts, fowles, profits, perquisetts, commodities and hereditaments, within the sayd 100,000 acres of land, so to be taken. And all royall fishings, wrecks, flatsum jatsan, lagan, waifts in all places, and at all times, to them their heires and assignes, forever, as was largely set downe in an Instrument beareing date ye 20 day of Aprill in the twentieth yeare of CHARLES the First, by the grace of God, of England, Scottland, France and Ireland, King, defender of the Faith, etc., between ROBERT, Earle of Warwicke, Lord High Admirall of England, of the one part and Collonell JOHN HOLMESTEAD, and Associates, on the other part, who in pursuance of the sd Commission, did imbarque in severall ships, a great number of sober judicious people, bound for the Island Trinidada, who landed there January, Anno 1644, but fortun'd to sett downe in a fertile piece of ground, on the south syde of the Island, the Earth full of Springs wch. sort of land, is alwayes unhealthfull at the first opening, being cloyed wth. undigested vapoures, besides it was the Leeward side of the Island, wch. Barred them the Injoyment of the naturall trade wind, or East, north-east breezes of those partes; likewise that part of

the Island endures y<sup>e</sup> cold foggs that arrives from the Great River Oronoque; w<sup>ch</sup>. the Trade wind will not lett passe to y<sup>e</sup> North, and East partes of the Island, and meeting w<sup>th</sup>. repulse, falls down to the South and Westerne part, and most of all in the Cod of that bay, where those gentlemen settled: all these thinges concurring to make these people unhappie (in the loss of their health) w<sup>ch</sup>. they too late deserned, for such violent feavours seized them, that in a few months y<sup>e</sup>. liveing could scarce bury the dead, and those left, the yeare following, deserted the Collonie they had began to settle, and embarked some for Barbados, and others returns back againe for England. It was observed, that in their greatest extremities, the Arawacoes and Nepoyes Indians, shewed them Extraordinary kindnesse.\*

The other Collonie under the Command of Major HARTLEY, although they had lived there five yeares, w<sup>th</sup>. out any considerable Mortallities, as being the greater part planters, from St. Christopher's and other of the Islands in those parts; and had more Judgment to make choice of a dryer and fitter peice of land, to build on, then the other Collonie, who were most of them strangers to the businesse of plantacions, yett these people had likewise settled on the Leeward side of the

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\* In *Colonial Papers*, Vol. XX, No. 202, is a description of the Caribbee Islands, supposed to have been written about 1666. It is therein stated, under the head of Trinidad, that the English planted a Colony there in 1646 (?1644), but finding it unhealthy they deserted it within two years. *Calendar of State Papers—Colonial*, 1574 to 1660. p. 436.

On page 529, of the same *Calendar*, it is stated that, between 1643 and 1647, 600 persons emigrated from Barbados to Trinidad and Tobago.



Island, by the place called Warwick River in ye Chart and had pitched upon yt place, feareing ye Spainyards.

The same yeare 1645, these people likewise deserted their Collonie, feareing the Report of that Mortallitie, that of late had been amongst their neighbours, would not onely discourage all people, from comeing thither, but would likewise be a meanes to animate the Spanyards against them; Yett before they would leave the Island divers of the gentlemen at the request of the Arawacoes and Sepoyes, Indians, did resolve to take a farther view of the Island, then they had yett done, and one Mr. WM. DRAX, a gentleman of knowne reputacion, one of those that went upon the discovery, and now lived in London, told the author that about 30 miles from the sea, by a river syde they mett with a Valley covered wth. large trees, whose barke was yellow as gold and the wood a delicate red, the earth as fragrant and reare like the smell of damask roses, and though these gentlemen, received this great incouragement, the Collonies upon the wing, and many gone, they were forced to leave this excellent country.

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## *Agriculture in 1829.*

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*By William Hilhouse.*

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[The following from a MS. in the Colonial Records in the handwriting of WILLIAM HILHOUSE, appears to be part of a descriptive handbook of the Colony which was never published. From internal evidence it seems to have been written about 1829, and is interesting for the light it throws upon the cultivation of the estates when the three products, Coffee, Cotton and Sugar, were well represented. Several foot-notes have been left out to reduce its length, but these omissions do not really affect the value of the paper.—EDITOR].

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HE first attempts at cultivation were made by the original Dutch Settlers in the vicinity of the falls of the three rivers, Essequibo, Massaroony and Cuyuni. Here may still be found, surrounded and intermingled with trees of the growth of more than half a century, small groups of cacao and coffee, with detached heaps of broken bricks, the mouldering ruins of cisterns, and wrecks of the industry of a former generation. On traversing the sites of these long abandoned abodes of our colonial forefathers one cannot help being struck with the idea, that their lives must have been one uninterrupted scene of ease and enjoyment. The most salubrious atmosphere; no mosquitoes, no fevers, or agues—detached fertile spots in the valleys, where as much cacao, coffee, cotton, or arnotto was grown as from 200 plantations could freight one Dutch Merchantman. The Jubilee of her arrival, with the Salempores, Osnaburgs, Scheidam and Karse, bespoke a year ago, and the mighty calculations of profit, on her

departure with the whole crop of a plantation 5 bags of coffee or cacao, or a bale of cotton. Those were happy times. In the whole colony security could not be found for a Mortgage of £30,000. There was no credit and consequently no debt, and the Patriarchal Burgomaster of Cartabo smoked his smuggled varinas, drank his consigned Scheidam, eat his fish, flesh and fowl, and wore his gorgeous suit of Salempores and Osnaburgs, without a thought of going home, or a care for the dun of a Mortgagee.

Had you told the old fixture of Cartabo, that one day there would be 70,000 negroes in the colony and a million of money vested for every hundred then—that two mutations were to remove his grandchildren from these beautiful hills and clear streams of the upper rivers to the muddy and flat seashores—that his dandy little 6 Gun Battery on Kyk-Over-All would be allowed to moulder into ruin—and that the transparent anchorage, where barnacle and shipworm dare not exist was to be changed for that stinking Paradise the mud-flats of Demerary—he would have smothered you with a wrathful expiration of his mundungus and “Soth for dommed you for a Ligger blexcum.” But, needs must where the devil of wealth drives.

Notwithstanding the epicurean indolence of the Old Planter, he made money, and being of simple habits and unacquainted with luxuries, he knew not how to spend it. In an evil day, he began to think that by a little more exertion, he might remove the scene of his enjoyments to Europe, and then came ambition, speculation, negroes from Africa, desertion of the delicious hill and vale of the interior and occupation of the muddy shores

of the seas, mosquitoes, fevers, steam-engines, rum-stills, mortgages, luxuries, protested bills, retained doctors and lawyers, and colonial coffin makers. The Burgomaster of Cartabo has sunk under this accumulation of care and misery, and JOHN BULL with his capital, and SAUNDERS with his perseverance and frugalty, more accustomed to the buffs and rebuffs of commercial speculation, have stepped into his shoes and into a life of incessant labour and activity, in dread of every wind that blows and every tide that rises, but in the constant hope of at last, by hook or by crook, making a fortune and going home.

The first consequence of this change has been the introduction of a regular system of Agriculture—for up in the hills, nature did every thing, draining was spontaneous, it was only necessary to clear and to plant; to renew below it was in the first instance necessary to *make* the soil, which was afterwards to be planted.

The Dutchman who had first settled the hills was still more at home even in the swamps, and he consoled himself for the loss of the comforts of the interior by making the Coast a second Holland. From her therefore he took his cue. And dams, canals, sluices and empolders (were reclaimed) from the sea, a portion of alluvion, unequalled in fertility and richer in its product than the finest gold ore from the mine.

Few monuments of human industry are more astonishing than Demerary as it now stands, whereby system and perseverance, in spite of miasma, the plague of pestilence, the sun and the wave, a population of 100,000 people reside beneath the sea and the level of that sea cover with fleets of Merchantmen laden with their produce in

a proportion absolutely unequalled by any other portion of the known world.

A Planter purchases a grant of 500 acres of land extending about half a mile in front on the sea coast and about a mile and three quarters towards the interior, between parallel lines. His first care is to throw up a strong dam in front to keep out the sea. His next step is to enclose a space of about 100 acres with an interior trench and an exterior bank or dam, formed from the earth of the excavation. He next erects a brick sluice, or wooden koker to drain off the water from this enclosed space which is called an empolder.

The empolder is now cleared of trees, and a canal is dug from the front to the back in the middle of the estate, which is the leading canal of navigation. From this canal proceed trenches to the right and left at about 150 paces distance, which extend to within about fifty paces of the side boundary; these navigable trenches divide the estate into 10 acre fields.

Drains are now cut from near the centre canal to the draining trench on each side of the estate, the distance between each drain being about 36 feet, which is called a bed. The navigation and drainage are now completed, the former being down the centre of the estate, and the latter round and down the sides of it, and communicating with a valve door, which lets off all superfluous water from within and admits none from without.

The heavy trunks of the trees are split up into firewood and the brushwood is burnt on the land; plantains are then put in at distances of from 12 to 16 feet in good land, 16 feet is the best distance as the suckers around the parent stool or root rapidly spread and reduce the

distance in 2 or 3 years to less than half, after land has been in plantains for 10 or 12 years, it is eligible for canes which if planted before this preparatory step are so rank and watery that the sugar is dark and of very bad quality.

When plantains are a year old, they afford sufficient shade to plant coffee or cacao in the intervals, the former in rows of 8 feet distance, the latter 16. In ground that is well drained and sufficiently elevated, the least breadth for a bed is 48 feet, but in low spots, and all estates abound with these, it is frequently necessary to reduce them to 30 feet with a trench of about 2 feet wide and as many deep, the ground out of which being levelled over the centre of the bed, raises it and accelerates the drainage. Bad work in this stage is easily detected, when the earth remains heaped at the side of the drain instead of being levelled over the centre of the bed, and occurs in every instance where the white overseer is not present on the spot to prevent it.

Small drains which separate the beds are sufficiently deep at two feet below the general level of the surface, but five feet is always required for the main or sideline drains, whatever be their breadth, in order to ensure a current from the small drains into them. A sluice or koker, to drain 500 acres of land should be 8 feet by 6 in the aperture if of wood, but if a cylinder of cast iron 4 feet in diameter will be sufficient. The bottom of a wooden koker should be within a foot of low water mark or it will be speedily undermined by the crabs. The top of an iron cylinder should be level with the bottoms of the small drains.

In February it is prudent to stop the valve doors of

kokers and sluices, and to preserve 8 or 9 inches of fresh water in the small drains, the ensuing month of March being generally very dry, and causing every kind of cultivation to suffer much. In August it will be prudent to preserve even more water within, to meet the long dry season.

A side line drain for 500 acres should be 15 feet broad at the koker, and may decrease to 6 feet at the back dam, but if the cultivation is to be rapidly extended it should not be reduced to less than 12 feet breadth throughout.

Supposing an equal remunerating value in the different articles of colonial produce, the first 500 roods from the sea should be planted in cotton, the second 500 in canes and the last 500 in coffee and plantains.

The first 500 being of most recent formation is too much impregnated with Marine salt to give good sugar till after many years of cultivation and drainage, and the last 500 roods verging upon the pegs lands has a vegetable surface highly favourable to the growth of plantains, coffee or cacao, but not of canes. Plantains are not injured by the salt of front lands, but they are too much exposed to the sea breeze, which throws them down before ripe, and renders it desirable to have them behind the other cultivation and as much sheltered as possible.

Coffee sows itself under the bearing trees in great profusion, the strongest plants at 3 or 4 months old are removed into the nursery where they remain at a foot apart till 15 or 18 months old, they are then planted under the shade of the plantains in any sized bed, at 8 or 9 feet distance. When three years old they are topped to about 5 feet in height at which they are kept for the

convenience of picking, they bear in the fourth year, and are in full crop in the sixth. In well grained and rich land they will last 30 years. The bean of the young trees is the largest and coarsest, that of old trees is small, with a great proportion of what is called barley coffee, and is of a superior quality. In the pegass lands of the Canals, the coffee tree grows to twice the size it does on the Coast, and its produce is much more abundant, but the bean is larger and the quality not so fine.

Sugar, now the only hope of the planter, has swallowed up all the other cultivations, and cotton, coffee, cacao, with every minor production have disappeared before it.

A field to be prepared for sugar must be first carefully levelled, spaces are then marked off of 3 and  $2\frac{1}{2}$  feet alternately from the first space, a shovelfull of ground is dug and piled up one on the second, so as to make a bank and shallow trench across the bed, this process is called cane holing.

The space between each bank is now dug up for 6 or 8 inches, loosened and broken small by the shovel, or hoe, this is called shovel or hoe ploughing.

The ground is now left for a few weeks to pulverise by the action of the sun and rain.

A negro is supposed to dig 12 feet square of a draining trench 5 feet deep in a day, 264 feet of a small drain, and to cane-hole 160 yards, each of which he is found to perform with ease under common circumstances between the hours of 6 o'clock and 3.

Six negroes will weed an acre of coffee and plantains in a day where the ground is well covered with grass.

Four or five negroes are required to an acre of canes, being 6 weeks after the spring the first weeding,



The second weeding at 3 or 4 months, requires about 5 or 6.

The trashing or pulling off the decayed and quailing leaves of the cane at 7 months old is the last work on them before they are cut, and requires about 5 negroes to the acre.

The plant cane is ripe in 13 or 14 months from the time of being planted; it is then about 9 feet long in average soils. From the top of it a piece is cut off about 15 inches long, and in which there is little sugar. This is again planted in two rows in the cane hole at about a foot apart, and at an angle of about 30 degrees, one third of the top being in the ground. The tops should be planted so thick that the upper extremity of the one shall nearly overhang the buried end of the preceding one. In very rich soils and a rainy season they may be planted much wider, and if the ground is very moist and the showers constant, they may be laid flat on the ground, the lower end trodden in with the foot, when every joint will throw out a shoot above and a root below.

Very great care is required in the first weeding of the young canes, as their shoots are not easily distinguished from the grass that surrounds them, and without constant watching the negroes will chop off both together.

In cutting the cane the negro first strips off all the leaves. He then cuts off the top for a plant, and the rest of the cane into lengths of about 3 feet, which are carried to the mill by punts. An acre of canes, producing two hhds. of sugar, requires to cut and carry to the punt \* able negroes. \* men and \* punts will carry canes to the mill for 4 hhds.

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\* Creoles of from 10 to 15 years, will unload the punts and carry their canes to the feeding board. Two men will feed an engine of 10 horse-power for 4 hhd. per diem.

\* boiler-men with one set of coppers will make 4 hhd. of sugar in about 15 hours.

If two sets of coppers are employed to make this quantity there is a most serious loss both of fuel and labour, which makes it absolutely necessary to boil 15 hours with one set, rather than any shorter time with two.

A box of liquor of 500 gallons will require fully 24 ounces of lime to temper in a cold state, on an average, though it frequently happens that one-half that quantity will be sufficient, and that as often double is required, according to the nature of the season and the age and quality of the cane.

The lime acts by neutralizing the acids existing in the cane juice, and rendering the mucilage insoluble, which rises to the surface in the boiling process and is skimmed off. In this stage the acetate of lime is still held in solution by the cane liquor, and as, by the ordinary process, no separation afterwards takes place, it destroys the colour and makes the manufacture on the wall very imperfect. The addition of alum in small proportions at this stage would perhaps be an improvement. The sulphuric acid would unite with the lime and the acetous with the alumine basis—making one insoluble compound and the other a harmless neutral.

The cane juice of Demerary contains on an average about 1 lb. of sugar to seven quarts of liquid. With good works, it is reduced to sugar in quantities or strikes of

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75 gallons each in 40 or 50 minutes, in open coppers, the fuel employed being the dried cane, after it has passed through the mill.

The cane mill of three horizontal iron cylinders 4 or 5 feet long, and about 2 feet diameter, one over the other two, does not press the liquor so perfectly out of the cane, but that a small portion of the saccharine principle still remains in the crushed cane. When this is carried to the shed for drying it therefore ferments, and the heat produced has the same effect in drying the cane as has the heat of a haystack in Europe. The expressed cane is called *megs*, and is preserved in large *logés*, or sheds, being the only fuel used in the sugar-boiling process.

Though it is absolutely necessary that the main bulk of the *megs* should ferment and dry in the shed or *logé*, it is found by experience that when taken from the mill and dried in the sun, a great change takes place, for the spirituous fermentation destroys a great deal of the inflammable principle, and it requires much less *megs* when dried in the sun to make a hhd. of sugar than if taken from the *logé* where it has heated; a saving of nearly 25 per cent is thus effected of fuel. But this can only be done in dry weather, say, four or five months in the year, sufficient time, however, to enable a careful manager to keep his stock of fuel ahead of his consumption.

The sugar, when of a proper consistency in the last copper, is struck, or ladled out into coolers, being broad shallow troughs of about six feet square.

Four or five of these coolers, containing four or five of these strikes, will give four hhds. of sugar. In this stage of the process there appears to be considerable room for

improvement. In the first place when the teach or last copper is emptied of its contents, a small quantity is left behind to prevent the burning of the teach—in the interval of charging up the copper—now, however short this interval, the portion of sugar left is twice boiled, oxidized and discoloured, and communicates its bad qualities to the next strike or boiling. In the next place, by throwing a hot layer of sugar over the cold one already in the cooler, crystallization is disturbed, and the colouring matter of the molasses of the second strike mingles with the crystal of the first and must have a very deleterious effect—the mixing up of all the strikes together in the cooler, only tends to make bad worse, and the obvious alternative is to cure or drain every strike of sugar separately; for every hhd. of sugar in the market shews a difference between the tops and the bottoms of nearly 50 per cent in quality.

There is in Demerary sugar a foreign compound which is hardly to be got rid of, but which keeps it far behind the sugar of the West India Islands—the muriate of soda or the marine salt. This is imbibed by the cane from the soil, which is strongly impregnated with it and communicates an evident saltiness to the sugar, especially from the first crops of canes, causing it to deliquesce in the passage home, and though it is evident that the refiners have found out the means of getting rid of it, the planters as yet have not.

It reduces the value of our sugars in the retail market fully 15 per cent.

The skimming of the impurities of the cane juice whilst boiling, being mixed with a portion of the molasses and water, is put up in vats of about 500 gallons each, and

when the spirituous fermentation is at its height, it is thrown into the still; this is called a setting, and the quantity of molasses added to the skimmings must always be in proportion to the richness of the cane juice.

If the canes are plants, the liquor will be weak, say 2 gallons of juice to the pound; the settings will then be  
 \* skimmings;                      \* molasses;                      \* water.

But if the canes be ratoons (after the second year's growth) the quantity of sweets will be reduced in proportion. No two estates or two fields on the same estate, give the same returns from the same proportions on account of the perpetual variations in the quality of the canes and the consistency of the cane juice; the following will be found to be good common settings, some better, none worse.

When sugar is potted, that is put into the hhds., in which it is find the market, it is allowed two or three weeks to drain off the molasses, after which it is called cured.

The expenses of the sugar cultivation are as follows :

|   |     |     |     |     |          |
|---|-----|-----|-----|-----|----------|
| An Estate of 300 Negroes, valued at £65,000, interest |     |     |     |     |          |
| at 6 per cent. is...                                  | ... | ... | ... | ... | 3,900    |
| Salary of Manager ...                                 | ... | ... | ... | ... | 300      |
| Doctor ...  | ... | ... | ... | ... | 150      |
| 3 Overseers ...                                       | ... | ... | ... | ... | 150      |
| Fish ...  | ... | ... | ... | ... | 290      |
| Clothing ...  | ... | ... | ... | ... | 300      |
| Repairs, Supplies, and loss of Negroes, &c.           | ... | ... | ... | ... | 1,500    |
|   |     |     |     |     | <hr/>    |
|   |     |     |     |     | £ 6,590  |
| <hr/>   |     |     |     |     |          |
| 500 casks of sugar at 60/ per cwt. (15 cwt.) ..       | ... | ... | ... | ... | 9,475    |
| 400 puncheons of rum at 12d. per galn. ...            | ... | ... | ... | ... | 2,000    |
|   |     |     |     |     | <hr/>    |
|   |     |     |     |     | £ 11,475 |

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But supposing the sugar to be only at 50 shillings, the net proceeds will be only £7,625. If 40 shillings, only £3,325, which will not pay the interest.

Nothing can be more absurd than the levying an equal duty of 27 shillings upon sugars so different in value, as from 140 to 60 shillings the cwt. It can only tend to destroy the trade of the refiner, because it would be much better for the planter to ship home no 40 shilling at all, or to clay it, if he lost half in the process, or to distil it rather than to ship it at a loss to himself.

On all plantations the first sugars must be of an inferior quality, and even afterwards a portion of every year's crop, being from plant canes, must also be dark. There are many processes by which the quality of sugars may be enhanced at the sacrifice of quantity, but the planter will never embrace these alternatives, as long as the low coloured sugars will bring a remunerating price. But when that is no longer the case, he must in his own defence decrease the quantity of his shipments and make in lieu a superior quality, by which the shipping interest is materially injured, and the refining trade totally destroyed, for there will be no longer any muscovadoes in the market, and the use of loaf sugar will be superseded by that of very fair raw sugar and Clays.

Twenty-seven shillings duty on sugars is 2d.  $3\frac{3}{4}$  per lb. The remunerating price to the planter is 3d., half of which is expenses. The merchant's charges are 8 shillings per cwt., which is about 1d. per lb. It gets therefore into the grocer's hands at a price of  $6\frac{1}{2}$ d. per lb., and is sold by him at from 8 to 10d. the lb., so that from every lb. of sugar made the king gets  $2\frac{1}{4}$ d., the planter  $1\frac{1}{2}$ d., the merchant 1d., and the grocer 2d. That is, the king has

183 per cent, the merchant 66 per cent, and the grocer 132 per cent, on the net value of the sugar.

There can be no further proof needed of the impolicy of duties, so extravagantly disproportioned to the prime cost of the article, and by means of which the consumer is made to pay three times the original value. Then, a piece of bread, whether grown in the country or not, is always made to keep pace with the price and the supply; of all the luxuries, sugar is nearest allied to the necessities of life, and ought to be subject to similar regulations in its consumption. The market is overloaded with sugar, but it is monopolized by the Crown, and the subject is debarred the use of it because he cannot afford to pay the King a tax of 183 per cent on it in addition to his present burdens.

The King of Spain's monopoly of tobacco, which cost him his South American provinces, was milder than this, for it was formed ad valorem and did not more than double the price of the article to his European subjects, but an impost of two hundred per cent on the staple produce of its own Colonies has never yet been levied by any Power in the world except England.

It is not necessary to enter into a detail of the process of a Distillery, which is conducted on the same principles as those of Europe.

The expenses of 400 puns. of rum are as follows :—

|   |     |     |       |    |
|---|-----|-----|-------|----|
| Fuel, per Pn.—130 cords at 15/...                                   | ... | ... | 97    | 10 |
| Labour, 600 days at 2/6   | ... | ... | 75    | 00 |
| Molasses, 10,000 gallons at 6d.                                     | ... | ... | 250   | 00 |
| Casks, each 30/   | ... | ... | 600   | 00 |
| <hr/>   |     |     |       |    |
| (£2 11/ per Cask) Total expense                                     | ... | ... | 1,022 | 10 |
| Value of 400 Puncheons or 40,000 gallons at 1/ per gallon (£5 each) | ... | ... | 2,000 | 00 |
| <hr/>   |     |     |       |    |
| Nett Gain   | ... | ... | 978   | 10 |
| Deduct interest on Distillery or 3d. per gallon to the Planter      | ... | ... | 478   | 10 |
| <hr/>   |     |     |       |    |
|   |     |     | 500   | 00 |

The Rum manufacturer has this high ground of moral superiority over the British distiller, that whereas the latter abstracts from the necessities of life and perverts grain from a wholesome article of food to deleterious luxury, the former only manufactures what would otherwise be an useless refuse, and is obliged to distil, otherwise the sugar duty would not leave him one farthing to feed either himself or his negroes. The British Distillery trade is optional, and it abstracts from the article of food, perverting what was intended for bread alone, to a more objectionable purpose. But the West Indian planter only distils what would otherwise run to waste, and the produce of which puts bread in the mouth—being a work of sheer necessity, and forced upon him by the exactions of the revenue. The British distiller takes from a necessary to fabricate a superfluous article, and the farmer would rather grow barley for him than wheat for others, so that the poor man's loaf pays a tax to the British distiller, and the Government authorizes the taxation when the same superfluity can be afforded by the West India planter, without objection as to the effect or means,—sugar is a useful and necessary article of consumption, and every puncheon of rum, must be concomitant with the production of at least \* hhds. sugar; there is something here to counterbalance the moral tendency of the fact. But with the British distiller there is absolutely no palliative to the destructive charge of turning bread into gin.

At this rate it would not be worth the while to distil rum at all, if the sweets could otherwise be disposed of, only that on an involved estate the petty sum thus realized is the only disposable revenue of the Planter,

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and is supposed with the molasses to defray the ordinary expenses of the estate and household.

Rum not being a necessary of life, admits of a greater taxation than sugar. It pays 1,000 per cent duty, British spirits not more than \* per cent, so that the British manufacturer clears \* times as much as the Colonial one, and the consumer pays \* times the Colonial value of the article.

For every 2 casks, one of sugar and one of rum, the King receives 72.10, and the manufacturer in the Colonies 20. Can the question be asked after this—of what value are the Colonies?

There is no crop time in Demerary. An estate of 500 hhds. will make from 30 to 50 per month. The best sugar is no doubt made in the driest weather, but then the plants are lost and the ensuing crop from the same field fails in consequence. There are so many advantages attending an equal distribution of the crop, that the power of being able to do so gives the Demerary Planter an immense advantage over the Island one.

In the first place the labour of the Negro is uniform and regular; in the second there is no material delay or detriment from the breaking of machinery; in the third there is no regular succession of ripe canes on the cultivation, and a secure crop from the portion planted in moist or showery weather. In the long dry season, the cane arrows, and the navigation is short of water. It not unfrequently happens therefore that in the month of October less sugar is made than in any other, the arrow of the cane being unfit to plant and the juice losing much of its saccharine principle whilst the cane is in that state.

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The advantages of navigation, distribution and certainty of the crop, and superior returns, certainly enhance the value of Demerary property 100 per cent above that of the islands. This is stiffly denied by the island planters, though fully proved by the conduct of the merchants, who certainly are good Judges of the returns of their own capital, and are always ready to advance it on Demerary, in preference to island property, an estate of 300 negroes in the islands not selling for more than £30,000, though in Demerary it is worth from 60 to £65,000.

In no other colony are the buildings of the sugar works on a greater scale of magnificence; those of an estate of 500 negroes will cost 20 or £25,000 and a stranger is apt to consider them as built in a style of superfluous expense. But the Demerarian, who in every thing else, is only anxious that it should last "his time" knows perfectly well that his land will be productive for a century, and that to sell it to advantage, his works must be permanently adequate to take off its produce, not only during his own time, but perhaps during that of two or three successors. Another great inducement to put up works on a large scale, is the great plenty on the spot, of the finest and most durable building timber in the whole world, but which timber when young and of small scantling is sappy, and quickly decays. It is necessary therefore to use beams of a large size, from mature and full grown trees—and these require a proportionate increase of strength and dimensions in the other parts of the construction. The expense of these immense buildings is therefore an inevitable one, and though it demands a great increase of capital in the beginning, is

an absolute saving in the end, as the inexhaustible nature of the soil would otherwise wear out two or three sets of temporary edifices, at an equal or greater expense than one permanent one, besides the trouble and time lost by repeated re-erections.

In fact though the common and avowed sentiment of the Demerarians is the mere provision for the moment, all the labours and speculation of man are on a scale of magnitude to endure and be realized in ages to come.

To such a nicety is the return of capital calculated, that three proprietorships will scarcely pull through one speculation, and the merchant's capital once engaged, is inextricable for a century. There is also as much of that capital advanced on a population of 70,000 slaves in Demerary as on 180,000 anywhere else.

It is a circumstance which gives rise to a most pernicious feeling of jealousy with what are called the old Colonies, and which is seized upon as a pretext, to saddle the Demerary planter with disabilities, unknown to the Islands (the folly of which is only equal to its injustice) that whereas the bounty of Providence has placed between the confluence of the Amazon and the Oronoque a belt of alluvion, capable of furnishing with one-third the expense and labour of any other tract in the known world, enough of every description of colonial produce to supply all the market in Europe, and that in this district every million of British capital is capable, if only subjected to the common restrictions of other Colonies, of producing more than double what it does in other situations. The British Government wilfully throws away the opportunity it thus possesses of underselling every other Power in the Colonial market, and purposely

reduces the natural advantages of the soil to a level with unproductive and exhausted tracts by trebling the price of labour employed on it. And seeing that it is notorious that the Demerary planter, if he could procure lands at the same rate as the Island planter, could send his sugar into the market at one-half the expense, and completely drive out all the sugars of the foreign Colonies, it yet prefers to enrich the Governments of Brazil, the Havannah and the East, by restrictions on the productive powers of its own Colonies rather than by giving them a fair field for competition to command once more a monopoly of the colonial supply of Europe.

If the alluvion of Demerary were cultivated at the same expense as other colonies, there is no other tract in any part of the known world, that could compete with it, for it could undersell them all one half, in the immense returns of its produce. This is evident, for though the restriction of the import of labourers has raised the price of labour to nearly three times its average value in other colonies, and the nett return of its produce is scarcely half that of the islands, yet does the crop, and the facilities of cultivation, enable the Demerary Planter successfully to compete with the other colonies, and the merchant finds his capital profitably employed, though obliged to advance more than double the amount, on the same means of cultivation; an estate of 500 negroes in Demerary scarcely being purchaseable for £100,000 though in the islands not worth £50,000.

However politic it may be therefore to preserve the population and cultivation of the islands in their present state, it is done at the sacrifice of the commercial independence of England and it introduces and main-

tains in the colonial market foreign powers, who derive all the benefit which would otherwise accrue to Great Britain, should she merely allow her Colonies in South America a just and equitable means of competition. It would then be seen that the level coast of Guiana, with its inexhaustible soil, its perfect system of water carriage, its peculiar appropriate climate, and its never failing crop, with merely the privilege of introducing the unprofitable and surplus slave population of the Old Colonies and thus reduce the price of labour within reasonable bounds; with this privilege, under every difficulty of the times, and giving to other powers even the advantage of continuing the Slave Trade, it must drive them out of the sugar market, for it could produce that article at a lower rate than is possible to be produced elsewhere, under any circumstances.

The knowledge of this fact occasions a jealousy in the old Colonies, from a dread of a consequent diminution of their political importance. They therefore oppose the measure of a transfer of labourers without considering that a removal of their capital to these shores is a direct means of enriching themselves and the mother country at the same time, and they allow local attachment to supersede a direct public and private benefit. For, allowing Guiana to become the great sugar emporium, for which it is so pre-eminently calculated, the Islands are yet eligible for all the other objects of Colonial cultivation which of necessity would be superseded here and the amount of their production would be little affected, though the description of it would be changed. No political considerations can effectually supersede the operations of natural eligibilities.

A country of ports and harbours will become, in spite of all obstacles, a maritime Power. A corn country will export grain, and a grazing country will trade in cattle ; under every disadvantage Demerary has gradually relinquished every other cultivation for that of sugar, because by nature most particularly adapted for that produce, and nothing short of ruinous and unjust restriction or actual and positive abandonment can prevent the British merchant from vesting his capital in a cultivation, so congenial to the soil, so certain in its profits, and so beneficial to the revenue, the shipping and the commercial interest. Demerary is the giant of the sugar market, and in the possession of any other State than the British, she would allow of no competition.

The average return of a sugar estate in moderately favourable circumstances, with 500 negroes of all descriptions attached, is about 1,300,000 lbs. per annum.

#### COTTON.

The cotton heretofore cultivated in this Colony has been brought from the South-east and the neighbourhood of the Amazon. Not being indigenous, its crop is very uncertain, and though superior in quality to most other kinds, it does not come within 30 per cent of the price of Sea Island.

It is cultivated in similar beds to the coffee and planted in squares of 6 or 7 feet apart, A handful of the seed, as separated by the gin, is thrown into a hole about 3 inches deep, in moist weather ; a dozen of these seeds will perhaps spring, from whence all the weaker ones are thinned away, till one strong healthy plant remains, this is trimmed in the month of June to the height of 5 feet from the ground, and picked in July and October, the last being what is called the great crop.

A prevalence of northerly winds after the blossom, infallibly produces what is called the blast, this is known by the pod becoming full of red spots, afterwards turning black, and, on opening all such pods, the wool will be found destroyed and discoloured, and the seeds rotten. In some seasons, not an estate in the whole colony escapes the blast, and of late years the country, being more cleared, and the cultivation consequently less sheltered in such situations, it has not been possible to keep up the cultivation in consequence.

In the month of June or July immense flocks of a palish yellow Butterfly, the males of which are of a bright gold colour, may be seen flying from the east to the south-west.

These deposit their larvæ in the grass of the savannahs and cotton fields, and when the grub comes out another pest makes its appearance, fully as destructive as the blast. This is called the shrivel, and so rapid is its power of destruction that in 48 hours an estate in full prospect of a great crop will appear as if fire had gone through it; not a leaf, a blossom, or a pod being left upon the trees, which appear like a desert of dry sticks.

Cotton, however, is of quick growth, and with all its uncertainty gives a fair return if its value in the market be one shilling per pound, or if negroes to cultivate it can be procured at less than £100 per head, the expenses of its cultivation being very trifling.

The British Government has often declared its object in keeping possession of these Colonies to be the preservation of the cotton cultivation. And the steps they have taken for this purpose may be duly appreciated when it is known that shortly after their becoming

possessors there were upwards of four hundred plantations exclusively planted in cotton. Innumerable acts were promulgated for the security of the Cotton Colonies, and injunctions without number were issued for the preservation of that cultivation so essential to the welfare of the nation. But it does not always happen that Statesmen accomplish what they intend to do. In this instance, like GULLIVER shewing his agility, they have most foully bewrayed themselves, for by their measures for the protection of the cotton cultivation, they have reduced it from 400 estates to less than ten, and thrown the trade entirely into the hands of Brazil and America.

At the period of the abolition of the slave trade, sugar, which was coming into general cultivation here, gave so much superior a return to the other staples, that the cotton proprietors either changed their cultivation or sold to sugar estates. The British Government not only paid no attention to this abandonment of one of its grand colonial interests, the cotton, but allowed foreign Powers to carry on the slave trade for many years without a check, and as it required only one year to make the Guinea negro a returnable cotton labourer, Brazil and America in an instant sprung into the exclusive supply of the cotton market, and as the slave trade was still open to them, though closed to us, they could procure negroes at £30 or £40 per head, for that cultivation, whereas the British planter was obliged to pay £100. Immediately on the heels of this absurdity came the order to prevent negroes being removed from one Colony to another. This again doubled the value of the Demerary negro and rendered his employment in any other cultivation but



that of sugar, impossible. So that the British Government, in their zeal to get rid of the odium of the slave trade, have given other nations the bribe of the exclusive supply of the cotton market to take the sin off their shoulders, which, it appears, with the bonus of two or three millions a year, they have no scruples of conscience in doing, the poor son of Africa being just as much a slave as ever, with the pitiful consolation that he can have any master but a British one. This is certainly *parturient montes*.

There is, however, yet a means of restoring in some measure a part of the cotton culture, were there any faith in Princes, or in the pretensions of a British Ministry, or in their sincerity on the score of national prosperity.

There is yet a sufficiency of virgin land on the coast eastwards of the Essequibo, to establish a new cotton Colony, adequate to the employment of 50,000 negroes from the Islands, in a most fruitful soil, and with every natural advantage for subsistence and cultivation, being the salt alluvion, so peculiarly adapted for the growth of cotton; in favour of which measure another circumstance has recently transpired of great moment.

Late enquiries into the properties of the indigenous cottons cultivated by the Indians have proved that other varieties exist, much superior to the ones hitherto cultivated, promising a greater certainty of return in some kinds, and a very superior quality in others; they are here enumerated:—

1st. The Doyuma, or dwarf recumbent cotton. This cotton gives a regular and almost certain crop, being scarcely at all affected by either the blast or shrivel, and yielding considerably more than the old cottons in the

most favourable seasons. This cotton is rather short in the staple, and not easily ginned. It is, however, very durable and fully equal in value to the Orleans cotton of America. It is without doubt the best adapted for general cultivation.

2nd, The Iffetackaasery, or large-brown close seed cotton. This is scarcely inferior to Sea Island, and though equally uncertain in the crop, is at least 50 per cent above the common sort in market value.

3rd. The Comacka, or water cotton. Very yellow, coarse, and so durable, that it is nearly equal to hemp for nets and fishing lines.

There are nine other kinds of native cottons hitherto unknown or uncultivated, presenting various desirable properties, giving a choice of selection and an advantage to the future cultivation of this article which it has never yet possessed, the culture being hitherto confined to the close and loose black seed cotton, which is not indigenous, and is consequently more precarious in its returns than we may reasonably expect the native cottons to be.

Should the British Government, therefore, ever become convinced of the policy of again becoming the grower of this article so necessary to its manufacturing prosperity, there is a million of acres of cotton land in Pomeroon and 12 new and superior varieties to cultivate, with 50,000 unprofitable negroes in the islands, who could not be better employed than in making the attempt.

#### PLANTAINS.

The *Musa Paradisaica*, is the staff of life of these colonies, one of the peculiar productions of the alluvion which gives a wholesome and favourite farinaceous food to its compact population, at so small an

expense of labour, that it may almost be reckoned spontaneous. There are two varieties, the black and the white, the former having a purple stem and the latter a pale brown one, being also rather taller, but there is hardly any perceptible difference in the appearance or quality of the fruit.

The white plantain is called by the natives the creole plantain, and is reported to be indigenous, but neither of the kinds produce seed, fructifying and ripening in the utmost perfection. The pericarpium is only filled with a number of black grains, totally abortive. It is supposed that the male plantain has never been introduced, and that the one now grown is only the female, which, when impregnated by the male, produces a number of hard black seeds very inconvenient in the mastication, and which has been the reason of the total eradication of the male plant.

The plantain, in common with all broad palm-leaved plants, delights in moisture, both of soil and atmosphere. It must, however, be well drained in the rainy season, though sparingly so in the dry. A succession of unusually dry seasons and the extension of the sugar cultivation, which has denuded the plains of the Coast and destroyed those sheltering belts of trees that formerly protected the plantains from cold and high winds, with other minor and co-operating causes, have latterly introduced a kind of epidemic amongst the plantains which has filled the colony with well-founded alarm. Hundreds of acres in the most flourishing condition have sunk in a few weeks, as if fire or the wave had gone through them, and this without any distinction of soil, circumstances or situation.

The prevention of this "disease," as it is called, amongst the plantains, is a point of such high moment that we wonder high premiums have not been offered to that effect. A continuation of it to such an extent as to oblige the negroes to be fed on ground or imported provisions, would be a reduction of the value of property 25 per cent.

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## *First Impressions of the Colony.*

*By W. Arthur Sawtell.*

**I**T is usual to disparage first impressions. They are deceitful, says the proverb, and the majority of mankind, being slaves to aphoristic dogma, have no good word to say of them. They are regarded as a kind of necessary evil, like the measles and other infantile disorders. Everybody gets them, but they are to be spoken of with an apology and never dwelt upon as an interesting or a profitable topic. And yet in a sense every impression that our minds receive is a first impression. Each new conception, each fresh conclusion—though it may displace a train of others relating to the same object—is only another impression resulting from a previously undiscovered point of view. One standpoint ought to be as good as another, but it is the accepted verdict that the impressions gained from the earlier one are worthy of no consideration. Hence arise the exaggerated value placed upon the judgment of age, and the equally excessive disparagement of the opinions of youth. Most men are content to take all their philosophy second-hand from the copy-books, and *Experientia docet* has long been deemed an axiom far beyond the range of argument. Much, however, depends upon the scholar, and, further, the lessons of experience are frequently not worth learning. Many men lose all sap and vitality in that rigorous school, and have nothing more than *vanitas vanitatum* wherewith to cheer themselves at the end. The callow youth, with all his ignorance of

life, may often be at least more interesting, if not more useful, than the experienced dotard ; and the adventurer setting out with swelling heart for El Dorado makes a more inspiring sight than the tired way-farer nearing with reluctant step the Valley of the Shadow. As with life in general, so with its particulars. It is the generally received opinion that the stranger, if he would escape both resentment and derision, must keep his first impressions of a new acquaintance or a newly found locality strictly to himself. Yet I have known many men who could give at once a more intelligent and a more interesting account of a place to which they have paid merely a flying visit than others who have lived there all their lives. In each case the story probably will require seasoning with several grains of salt to make it fit for ordinary consumption. But with the world at large the "reminiscences" of the oldest inhabitant will weigh far heavier than the "impressions" of the fugitive visitor. Fully conscious of this bias against the opinions of the new comer, it is with some timidity that I take my pen to write my "First Impressions of the Colony." The editor of *Timehri* in suggesting to me this subject, has presented me with a rare opportunity of "giving myself away." But I hope to walk warily and to give as few occasions as possible to the expectant critic. It will be well at the outset to emphasise the fact that what I have to say in this paper will be strictly my first impressions, which I set down for what they may be worth.

At the first sight Demerara is disappointing. To one who has never before passed beyond the temperate zone, and whose mind is aglow with pictures of the sunlit seas and golden harbours of the tropics, there is a

great shock of disillusionment in the shallow muddy waters, and the low ugly wharves which stretch along the city side of the river. Even the stranger does not expect mountains in Demerara, for the general character of the country is well-known, but the flatness of the place transcends all his anticipations. However prepared may be his mind for a low-lying dead-level landscape, he will say in his heart, "Bless me, I did not think any place could possibly be as flat as this!" My first sensation on reaching the deck of the *Eden* on a cloudy morning in September was one of disappointment mingled with wonder. There was so little to look at that I did not experience even so much of the sense of novelty as when one crosses the English Channel and it was a great wonder where Georgetown was. After a while, from certain stumpy-looking spires appearing above the line of wharves, I judged there must be a considerable extent of town behind the inelegant sheds at the waterside. On closer inspection, it seemed as though Georgetown, with its broad river and its shipping, might pass for a very poor imitation of Antwerp, if it were not for the absence of the dominating spire and the presence of the cabbage palms, which instantly labelled the place as tropical. Once ashore, however, I soon lost my sense of disappointment in one of surprise at the broad rectangular streets, the creditable buildings, the lively stir of Water Street and the orderly character of the Stabroek market. I think these things strike one before one grows aware of the strange medley of races and the other peculiar features of the place. At any rate, they were what I noticed immediately in driving from the stelling. Next in order, if I remember aright, came the wealth

of vegetation which distinguishes the town, and especially the number of graceful palms constantly waving their green tops against the brilliant blue of the tropical sky. Then, of course, the trenches strike one with a sense of strangeness, and the presence amidst these unaccustomed environments of such familiar objects as telephone wires and tram-cars enhance rather than diminish the effect of novelty. The sight of poultry, goats and other live-stock picking up their living in some of the most frequented streets, is at first somewhat comical to those who have always associated such things with farm-yards or suburban back gardens, and the almost entire absence of smoke is another thing which the Englishman finds a difficulty in reconciling with the fact that he is in a large and busy town. These are trivial matters, but I write them merely to show what first strikes the visitor in the capital city of the Colony. After you have once mentally assimilated the trees and the trenches, and the terra-cotta coloured roadways, there is not much in the town itself to arrest the fancy or to please the eye. It lacks that distinctiveness of local colour which one expects on coming for the first time to the tropics, and one is soon thrown back upon the study of the human document. Here there is enough novelty to satisfy the most observant traveller.

I suppose that few cities in the world can equal Georgetown in the variety of races represented amongst its inhabitants—that is to say, in proportion to its population.

Although I had prepared myself by a perusal of RODWAY'S "West Indies and the Spanish Main," and with information from such other sources as were at command, the actual sight of the racial *mélange* which may be daily



encountered in Water Street was surprising and bewildering far beyond my pre-conceptions. The infinite gradations of colour, the association of African, Asiatic, European and American types, the variety of costume, and the intermingling of at least three different tongues, arouse an interest which survives many other novel sensations. He whose ideas of the Negroes have chiefly been derived on the one side from *Uncle Tom's Cabin*, and on the other from the "Minstrel" entertainments of Messrs. MOORE and BURGESS, finds at first sight of the black man *in propria persona* that there is much to learn and to unlearn. The free and independent air of the black labourer and the imperial carriage of his woman-kind are, to say the least, unexpected, and at the same time one cannot but remark how easily the veneer, at least, of civilisation is borne by a people, who, you will quickly be assured, are incapable of genuine moral, or intellectual advance. This paper must not become an argumentative dissertation on the possibilities and limitations of the West Indian Black, but I may observe in passing that those who hasten to apprise you of his inherent and incorrigible degradation not only expect too much of a race not more than two generations removed from slavery, but also implicitly belittle the achievements of English civilisation as a reforming influence. From a merely impressionist point of view, it must be admitted, there is very little that is attractive in the Blacks. They appear to the observer as a people which, having lost its own language, traditions and every distinctive feature except, of course, its physical type, has borrowed the outward characteristics of an entirely different race, and, superficially at least, the borrowed

plumage is hardly becoming. They appear to have, if I may so phrase it, a certain rustic vulgarity which, to the stranger, is far from prepossessing, while their extravagant apeing of their superiors in dress and so forth is grotesque without being amusing. Their æsthetic value is exceedingly small, and in this respect they stand in contrast to their East Indian neighbours.

In the *tout ensemble* of a Demerara crowd, the Coolies strike a distinctive and a pleasing note. It is interesting to see a band of estates Coolies on a visit to town wandering, gravely desipient, through the streets—the men, in their white, gracefully folded garments, the women in flamboyant muslins, their bare arms loaded with bangles, and the pretty children trotting alongside, pictures of childish content. Their incongruity with their environments and their apparent consciousness of being strangers in a strange land give them an attractive and somewhat pathetic aspect. From a picturesque standpoint it will be a sad loss to Demerara if ever the Coolies are taken from the colony, or if, as is not impossible, in course of time they are Anglicised out of their superficial characteristics. And here I may address a word to Ministers and others pursuing the praiseworthy aim of converting our East Indians to Christianity. Do not insist upon a change of wardrobe with a change of heart. I have yet to learn that the wearing of trousers necessarily implies a special degree of moral excellence, or that, whosoever will be saved before all things it is necessary that he provide himself with a shirt and a pair of braces. There is a tendency to regard trousers as an essential article of faith; but consider, I pray you, the unloveliness of that funicular apparel, pause and contem-

plate the dread possibility of all mankind passing through this mortal vale with their legs encased in absurd cylinders of cloth. Spare the Coolie at least from being compelled to conform to the sartorial ugliness of "civilisation." Speaking of clothes, one soon learns to envy the Chinese of the colony their eminently rational costumes, which seem to represent the beau-ideal of tropical dress, so far as the tunics are concerned, at all events. It is astonishing to the new comer to notice the extremely English appearance of the business and professional classes of the colony. Except for the head-gear—which itself is as a rule quite insufficient to protect the head unless supplemented by an umbrella—there is little to distinguish nine out of every ten of the whites of the colony from their brethren oversea. Here and there you occasionally see a man in a drill suit, and he is only a little less conspicuous than Mr. T. G. BOWLES, M.P., in the House of Commons during the Dog Days. But on the whole cloth, frequently dark and heavy-looking, prevails. I am told that there has been a considerable decline recently in the popularity of the top hat and frock coat. One would not imagine so after watching the streams of top-hatted black gentlemen who fill the streets on a Sunday morning; but if there is a revolt in the colony against this preposterous style of headgear, I am inclined to congratulate the people of British Guiana upon the fact.

I did not set out upon this article with the purpose of telling all I saw and did within the first few weeks of my arrival in the colony, so that I cannot stay to speak of visits to sugar estates and other little experiences, which, though entirely novel to me, would seem very

common-place to my readers. There are many things that one might mention—such as the curious Creole intonation, with all the emphasis thrown forward instead of backward, according to the English tendency—but time and space impose their inevitable limitations. Suffice it to say, that after the momentary disappointment on arrival, of which I have spoken, I found Demerara by no means the least agreeable of places to which fortune or adventure has conducted me. The first impressions of the place are certainly pleasant, and for some months after arrival the new comer is apt to congratulate himself daily that he has not yet been carried off by yellow fever or yet expired in a swift and horrid death from the bite of some venomous serpent. The absence of these imminent risks to life, which live so vividly in the Englishman's conceptions of Demerara, is not without its penalty. Existence has a certain zest when one knows, or fears, that his footsteps are dogged by disease, that poisonous reptiles lurk for him in the bath-room, and that desperate men lie in wait round every corner. Take away these sources of excitement, leave a man in the normal security of a sedentary career, and colonial life necessarily grows somewhat monotonous. Lack of interest follows on familiarity, and custom soon stales the variety and novelty of a new environment. Places gradually appear different and less attractive as we know them well, and things are not what they seemed in the first flush of new acquaintance. Ah, if we could only retain all our first impressions, what a goodly world this would appear! "It might be thought," says DAUDET, "that there is some colouring matter in a child's eyes which lasts as long as the ignorance of his early glance; but which, as

he grows up, tarnishes and dims all that he formerly admired. Poets are men who have kept the eyes of their childhood." We cannot remain children, and few of us are poets. Gradually we lose the rose coloured spectacles, through which our first impressions come, and smoked glasses seem better adapted to our sight.

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## ***Tobacco and Cotton Cultivation in the British West India Colonies.***

*By William H. Burnley.*

[The following letter from the *Guiana Chronicle* of May 4th, 1840, gives a planter's views on what was then a burning question in the West Indies. Cotton has been virtually driven out of cultivation for want of a little assistance at the right time; sugar may be ruined in a similar manner. Would it not be possible for the British Government to give the sugar colonies a little help for a term of years as here proposed?]



THE following letter from Mr. BURNLEY was written in reply to a communication from Mr. VERNON SMITH, Under Secretary for the Colonies :—

“Paris, 18th January, 1840.

Sir,—I have the honor to acknowledge the receipt of your communication of the 6th instant, in which you express Lord JOHN RUSSELL'S desire to know what encouragement I consider it advisable that the Government or the Legislature should extend to the cultivation of cotton and tobacco in the West Indies, and whether I am under an impression that any difficulty is opposed by the law as at present in force to the introduction of these articles into the markets of Great Britain.

The chief difficulty which in this last respect presents itself, arises from the imposition of an export duty of 3½ per cent. on all articles, the growth and produce of the island of Trinidad, which being paid in advance at the time of shipment, may be considered as fully equal to 5

per cent if levied upon the same articles when delivered for home consumption, and sometimes to considerably more, when it is liable to diminution in quantity and weight during the voyage. In the United States of America no duty is paid upon the export of any articles of native growth, and the continuance of the import described in our colonies will almost amount to a prohibition of their productions in the British market, and decidedly interfere with any considerable extension of the cultivation of cotton, or of any other article in which an active and industrious population, exempt from that burden, can enter into competition with us. The removal of this colonial duty would place us so far on a footing, and enable us fairly to contend with any competitors starting from the same point of departure. But unfortunately this is not our actual position. The planters of the United States have long furnished the chief supply of cotton and tobacco for the European markets, and have acquired, by time and practice, so much skill in their cultivation, and dexterity in the best modes of preparing them for consumption, that a mere equality of duty will not now enable us to enter into successful competition. In fact, we are altogether ignorant of the cultivation and curing of tobacco for exportation in our West India colonies; and although a constantly diminishing quantity of cotton is still exported, the mode of cultivation and cleansing of the wool from the seed remain in the same unimproved state in which they existed twenty-five years ago; and a new system and new machinery must now be introduced at considerable trouble and expense before we can hope to compete with foreign growers. After much consideration, and with the strongest reluctance to come to such a con-

clusion, I am decidedly of opinion that no powerful and successful competition can be established on our part, unless a *temporary* bounty on both these articles, the produce of our colonies, is allowed in Great Britain ; and by the term "bounty," I mean an extra price afforded to the planter over and above the market value, whether given in the shape of a differential duty, or in any other mode productive of the same effect.

I am quite aware of the general unpopularity of bounties at the present day, and that the simple proposal of such a measure may, in some quarters, be scarcely tolerated ; but the investigation I have necessarily been led into, induces me to believe that this indiscriminate reprobation of a once favourite policy, is only a reaction of the public mind, disgusted at the frequent abuse and misapplication of bounties during the last century, which, rushing into the contrary extreme and denouncing all bounties as injurious, may be productive of equally mischievous errors, for it seems difficult to conceive how any of our manufacturing processes, at present so essential to our national existence, could ever have been created or supported in their early stages, without some great advantages conferred upon them over their rivals. Our cotton manufacturers could never have commenced with a chance even of limited existence, if they had not been protected against the competition of India by heavy duty on foreign cloths ; and even without this legislative aid a proximity to the home market and centre of consumption, gives to our productions generally an immense pecuniary advantage over foreign competitors, with which few of them could dispense. If we possessed in the the colonies only this advantage—if the cotton fields of



Trinidad could be brought into the neighbourhood of Manchester—I should probably have no occasion to point out to his Lordship the necessity of legislative protection ; but we, unhappily further removed from the home market than the rival we wish to supplant, which, added to acquired skill and previous possession of channels of supply makes the odds so great against us, that success, I fear, is hopeless, unless the legislative aid I pray for is granted. So far from such a measure being at variance with the soundest principles of national economy, it appears scarcely possible not to see and admit the immense advantages to be derived by a mercantile and manufacturing nation like Great Britain granting a sufficient protection in infancy to any colonial raw production, manifestly capable, when at maturity, of successfully competing with similar articles from foreign countries. That the cultivation of cotton and tobacco in our West Indian colonies is subject to this description, no one acquainted with the latter can doubt. In the article of cotton the West Indian staple is decidedly superior to that of the United States, under all the disadvantages of rude cultivation, and still ruder machinery, with the single exception of the quality termed “Sea Island,” which is entirely confined to the limited district in which it is produced: it is certainly therefore no unreasonable expectation to look forward to the production of something equal if not superior to “Sea Island,” when British capital and enterprize are fully employed on the varied soils and situations which our wide extended range of colonies present. Of their perfect adaption to the growth of tobacco, although at present exporting none, I have not the slightest doubt,

for the plant rises almost spontaneously in every negro garden. The tobacco of Varinas, a province on the River Orinoco, and that of Cuba (both growing in widely distant latitudes, throughout which from North to South our colonies lie) have long been considered superior in their respective qualities to those of the United States. At the Indian Mission of Siparia in Trinidad, the Aborigines have immemorially been in the habit of growing and manufacturing for their own use a quality fit for segars, of so high a flavour, that those who profess to be judges assert that they require only to be known to be held in equal estimation with those of the Havana. By every rule of analogy, therefore, we have a right to conclude that our West India Colonies are capable of producing every variety of tobacco of the most approved quality.

Upon a review, therefore, of the whole subject, I beg respectfully to express to his Lordship my opinion, that the removal of every description of duty, or public charge, upon the exportation of cotton or tobacco from our colonies, would enable the British planter to grow these articles on equal terms with the people of the Southern States of the American Union; and that their cultivation may be carried on advantageously by the aid of emigrants from thence, which, at the expiration of some period of time, may become a valuable branch of colonial trade; but that no riper growth and extension of these productions, or successful competition with foreigners in the European supply, can be expected, unless a *temporary* bounty in their favour is granted by Government, sufficient in amount to induce capitalists to take such an interest in their cultivation as may render it immediately both profitable and popular.

But I beg clearly to be understood, as to the description of bounty which I venture to recommend, also, to the nature of the difference between a protection granted permanently, or for an indefinite period of time, and a protection granted only for a limited and specified number of years, which difference I conceive to be so important, as to place them in totally different classes, both in principle and in effect. By the operation of a bounty granted for an indefinite period of time, almost all the errors hitherto committed have been produced; for under such circumstances the capitalist is invariably tempted to extend cultivation to improper soil, and to create unnecessarily expensive establishments. He calculates, naturally, not upon what he could profitably do if the bounty did not exist, but upon what he is able to do during its continuance, which he believes will be permanent, but under the operation of a temporary bounty limited by the act to an affixed period of time, his calculations will necessarily be formed upon a different basis. He will see before him the exact period when all legislative protection will be withdrawn, when he will be left to his own resources, and the profits of his speculations must depend upon their own intrinsic merits. No new lands will consequently be broken up, or establishments erected, which do not hold out a sure promise of a profitable return when exposed to the future competition of the most formidable rivals. In the case, moreover, under consideration, it would give him time and facilities to search for and convey to our colonies persons skilled in the cultivation of cotton and tobacco, with proper tools and machinery necessary to prepare them for exportation; and the losses consequent upon all first efforts and

experiments would be fairly compensated, until the best process became familiar and easy of execution. A most important point would also be gained by the Legislature being bound to nothing, directly or indirectly, but the payment of the bounty for the limited period assigned, at the expiration of which it would be in possession of all the experience and information derived from the experiment, and at full liberty to continue, modify, or conclude it, as of due consideration might be deemed most desirable; no vested interests could possibly be created with power to embarrass the decision, and no individual could raise the shadow of a claim for compensation, under the plea of having embarked property in expensive pursuits on faith of legislative promises, subsequently broken. I am not aware of any bounty or protection having been granted by Government in the limited and restricted mode I have described. A measure analogous to it in principle, exists in the American Tariff of Duties on imported manufactures, which varied annually in a decreasing scale until 1842, when, by the letter of the act in force, it assumes the form of a fixed and permanent protection. But no one acquainted with the character of the people, or the spirit of their institutions, imagine that the progress of reduction will then cease, and this general impression is equivalent in its results to a positive provision in the present Act of Congress for its continuance. New manufacturing establishments are, notwithstanding, rising in various parts of the Union, founded upon no idea of permanent legislative protection, but upon a considerate calculation that, in a few years, they will be able alone and unassisted to support themselves; and in no instances whatever from the

opponents of a fixed Tariff did I hear any doubts expressed of the correctness of the principle of granting a temporary protection to their infant manufactures to enable them in due time to compete with the mature skill and decided superiority of our establishment. For attempting, therefore, a wide and extensive cultivation of cotton in the West India Colonies, it happens that our relative situations are exactly reversed; for in this respect, their great superiority has long been acknowledged and felt almost to our entire exclusion. It will not be unfair, therefore, to follow their example, and, if careful consideration be given to the subject, I think it will be found to be a wise and advantageous course.

Should his Lordship be of opinion that the reasons I have alleged are insufficient to propitiate the pure economists in favour of the measure proposed, I have then only to urge that the whole question relating to labour and cultivation in the West Indies, from the commencement of the discussion on the subject of the extinction of slavery, have, by general consent, been thrown out of the economical into the moral class: and that no measure can ever command success, which does not maintain a consistent course. The economists certainly never assented to the payment of twenty millions for the emancipation of 800,000 slaves; and if the enfranchisement of eight millions more, with the eradication of the cause which still continues to support slavery and the slave-trade, can be effected at an additional expense, I humbly suggest that it may be attempted, even without their concurrence. It appears, indeed, that public feeling has already declared itself decidedly in favour of this proceeding;—a high resolve has evidently

been adopted, that slavery shall be put down in its strong hold, by rendering the nation independent of its present sources of supply for cotton and tobacco; and the expense attending this great moral effort is viewed by its promoters only as a secondary consideration. The means, whether from public or private funds, will assuredly not be wanting, and I firmly believe that it remains only for Her Majesty's Government to reap the glory of properly directing this irresistible national feeling into the safest and surest channel through which the desired object can be most advantageously and economically accomplished.

**I have, &c.,**

**WILLIAM H. BURNLEY."**

## *Ruin !*

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*By the Editor.*

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AT the present time when ruin stares the sugar planter in the face, it may be perhaps useful to look back and see if any encouragement can be gathered from the past history of the colony. For, this is by no means the first time that the cry has been raised ; at intervals it has been heard for a century and a half. In most cases the causes for the depression were well known, and generally the planters also well knew what they wanted, as they do at the present time. Yet, although in some cases their petitions to the authorities were not granted, they still recovered after a longer or shorter time, or if one set of planters fell, others rose in their place, the general result being slow progress of the colony as a whole.

The first downfall took place after the discovery that the soil on the upper banks of the rivers was barren. Coffee gave but a small return, cotton could not be grown at all, and sugar paid for but three years at the most. Then, there was the want of labour ; slaves were imported in but small numbers, for the system of giving long credit made the West India Company very cautious. Almost before the estates on the banks of the river were properly surveyed, the grantees began to see that they would not pay, and when the cautious Amsterdam merchants, who had liens upon them, saw that their money was virtually lost, every attempt to raise capital failed. Some of the Barbadians, who had been lured over by

the offer of free grants of land and freedom from head taxes for ten years, then retired ; others came down to the coast and were more successful. They had bought their experience at a great cost and the migration turned out well, only the want of a full labour supply standing in their way.

The next disaster was the result of war. In 1781 the colony was taken by the British ; large quantities of produce on board vessels in the rivers were confiscated and everything put topsy-turvy. As if this were not enough the French allies of the Dutch recaptured the three rivers just as the British were getting straight, and a new confiscation took place. The planters, however, did not despair, but, notwithstanding many difficulties, from the arbitrary rule of the Company, gradually brought their estates into a flourishing condition. Then came the second British capture of 1796, which, however painful to a few Dutch planters, was by no means an evil. Capital flowed into the colonies from all sides, grants of land were taken up everywhere, until the whole coast line from Pomeroon to Corentyne, and even over to Nickerie, became one great stretch of cotton fields. With cotton along the coast and sugar and coffee in the lower parts of the rivers, and perhaps above all with the increased supply of slaves, the estates enlarged their cultivation annually. Then, produce went up to magnificent prices and the British thought that Guiana was indeed an "El Dorado." In five years of British rule the exports had more than trebled, and it seemed as if, notwithstanding high freights and insurances, all would become "Nabobs."

But the peace of Amiens and the restoration to the



Batavian Republic put an end to all these fine prospects. The British planters were ordered to sell out and leave ; then they could only ship their produce to Holland if the estates were put under Dutch management. There were plenty of sellers but few buyers, and, as a consequence, those who prepared to leave were ruined. All their hard labour went for nothing. It was then that *Pln. Turkeyen* was said to have been sold for a turkey. Fortunately, before all had disposed of their properties the British again arrived, but by this time produce had gone down and the best days of the planter were over.

Down to 1812 the markets continued to be depressed, and the "groans of the plantations" were heard throughout the West Indies. Cotton and coffee were even more depressed than sugar, and consequently became much neglected, but as yet were not abandoned altogether. The Southern States entered largely into cotton planting, and having fewer restrictions upon their labour supply, could beat the West Indies. How bitter were the complaints of the restrictions put upon the removal of slaves from the islands to Guiana after the abolition of the African trade, is well shewn later by HILHOUSE.\* With regard to sugar the drawback in the opinion of the planters was the high duty. It was over-production then as it is to-day, and the panacea was reduced duties, which, they believed, would produce the natural result, increased consumption. At a Meeting held at MARSHALL'S Hotel on the 30th of November, 1811, it was stated that the produce of the colony had decreased in value from £1,860,000 to £1,200,000. This they attributed to the destructive system of warfare adopted by the great enemy, NAPOLEON,

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\* See p. 45 *ante*.

who, controlling almost the whole of Europe, shut out British sugars. They thought that the situation might be improved by permission to export to the United States and to use sugar in distilleries.

Things began to look better as NAPOLEON'S fall approached. In 1812 sugar went up, and for a short period prosperity was restored, the British Government doing but little to promote this end. But, cotton never returned to its old price, with the result that sugar came to the front more and more. Coffee also was in a similar position, and no doubt would have gone out of cultivation had it required planting every year.

The downfall of cotton was most disastrous to those concerned in its planting. Three-fourths of the coast estates were abandoned altogether and have remained uncultivated ever since. All that long stretch between the Berbice River and the Corentyne, as well as the Mahaicony Coast, once glowed with the flowers of that handsome shrub, and some cotton estates turned into cattle farms on the East Coast have remained uncultivated since its downfall. Berbice suffered more than Demerara, as may be easily seen from the number of abandoned coast plantations. The Governor and some Members of the Council, as well as many others of less note, were obliged to compound with their creditors. Between the years 1809 and 1824, one hundred and eleven cotton estates were given up and only fourteen of these were replaced by sugar.

The ultimate result was that cotton was given up throughout the West Indies and that the British manufacturer became dependent on the Southern States. What happened during the American Civil War should

be a lesson, for it is probable that the cotton famine would have been averted, or at least rendered much less disastrous, had the West Indies received a little help at the right moment.

It was most fortunate that sugar could be made to pay when the other products fell—this redeemed the coasts of Demerara. Down to about 1820 this product realised good returns, and it almost seemed as if the colony would recover from the effects of the downfall of the other products. It was a case of the “survival of the fittest;” sugar had been proved and found successful—coffee and cotton lagged behind.

But, prices again fell, and again the planters complained that sugar could not pay. The cost of production varied; a few estates managed to keep the expenses of production below the market price, but others lost money. Then began those attempts to economise which have been continued down to the present day. Systematic cultivation, steam engines, organisation of labour, and finally the vacuum-pan, helped to reduce the cost. It must be remembered that all the Demerara sugar made at the beginning of the present century was muscovado, and it is enough to make the modern planters' mouth water to hear of a hundred shillings per cwt. for such muck as was shipped at that time. Is it any wonder that when it went down to about thirty shillings, everyone said they would be ruined. Petitions to Parliament were drawn up, a Committee appointed, and a loan to the West Indies recommended.

But, the great slavery question had now come to the front. Orders in Council limiting the hours of labour and giving civil rights to the negro produced great dis-

satisfaction, which continued down to the emancipation. Estate owners who could obtain capital to erect machinery, succeeded in making their properties pay, but the poor man with his mill driven by mules went to the wall. Those who remained raised money on mortgages which took into account not only the land, buildings and machinery, but the human property as well—in fact the last was of more value than all the rest. This produced so much trouble at the final emancipation that it may be considered as the main cause of the strong opposition. For, if a mortgage were given to the amount of two-thirds of the value of the negroes alone, without anything else, and the compensation was only one-third, or half the amount, the money lender had no hopes of ever getting the remainder. Then, the rumour of negro freedom shut up the purse of the capitalist, for what was the use of a plantation without labour. "Oh!" said the planter, "the British Government cannot interfere with private property; they might just as well take away your land and buildings." But, the cautious financier shook his head and the would-be mortgager had to do the best he could.

This uncertainty continued for about twenty years, producing such anxiety as is hardly conceivable now-a-days. The incomes of widows and orphans, besides those of planters, merchants and capitalists, were dependent upon a system which had been undermined. At last it fell, and with it came disasters hitherto unknown. Those who have talked with old people, both white and black, will remember what they said of the troubles which fell upon both. There were white people in Georgetown who sunk so low that they had to depend upon their

former slaves for daily bread. People talk of the cruelty of the slave system, but we may safely affirm that the negro on a plantation was far better off before the emancipation than now. The change was made too suddenly, and in an unnatural way. Serfdom in European countries went out slowly and its downfall caused few difficulties; the slave emancipation on the contrary produced awful consequences which are seen and felt down to the present day.

The great downfall came in 1838 and trouble fell at once upon the planter. The mortgagees came down like a flock of carrion crows and in most cases secured the compensation money as instalments on account. Only on account, however, for few estates had liens so small as a third of the value of their negroes. Wages had now to be paid and those who could pay got labour of a sort—others were perforce obliged to give up. Fortunate indeed were those who sold their estates to the freedmen, for they escaped the further difficulties produced by the abolition of the differential sugar duties. Eight years passed after the emancipation before those duties were abolished. Those planters who had not been ruined by the first revolution were struck down by the second. Only here and there was an exception; for example WILLIAM (afterwards Sir WILLIAM) ARRINDELL kept on Zeelandia by money gained in his legal practise. Lawyers of course did very well, for there were so many foreclosures and suits, but everybody else suffered more or less. Merchants failed, progress on every line was checked, the public roads were in many places quagmires, and in some quite impassable, and altogether every prospect of recovery was gone.

But, a few British capitalists stuck to the sinking ship ; at last by almost herculean efforts they pumped it dry and mended the leak. Coolie immigration and machinery were the panaceas ; the former was only conceded after a hard struggle with the Government. We have to thank JOHN GLADSTONE for initiating the system, and though his first introductions may be considered as failures, they paved the way for something better.

Slowly but surely the colony recovered. Presently the sugar export went up to an amount beyond that of the old times and the new estate owners began to breathe more freely. Although fewer plantations were in cultivation the acreage under canes was much increased, and then, a better kind of sugar was almost universally manufactured. Little fortunes were spent on machinery and buildings, with the result that the cost of manufacture was reduced as well as that of labour. The largest export of sugar in the old time was that of 1827, amounting to 71,168 hhds. and in 1838 it was 54,583 hhds. After the emancipation it fell gradually until in 1846 the total was only 26,211 hhds., the lowest point, after which it slowly but gradually began to creep up again, reaching 72,347 hhds. in 1861. Ten years later it crept up to 104,204 hhds. and got to its highest point in 1887 with 149,860 hhds., since which it has again declined.

The present crisis, like that of the beginning of the century, is the result of over-production, but whereas then it was only of cane sugar, now, owing to the bounty system, that from the beet rules the market. The Demerara planters think they might be able to keep on their estates if bounties did not exist, but the difficulties in the way of their abolition seem to be insurmountable,

merely on account of national jealousy. "JOHN BULL" is hardly likely to give up his free-trade principles for the benefit of the sugar planter, when he has consistently refused to do so for the British wheat grower.

What can be done? A great deal has been written about taking up other things, but the difficulties are almost insurmountable. Cotton is so low in price that a return to its cultivation would be useless; coffee is possible, but if this were taken up on the coast it would thrive only on the back lands of the estates, and even then would require Erythrinæ or other shade trees. This means the total abandonment of all the front lands, and the loss of all the capital—in some cases amounting to about a hundred thousand pounds—invested in Sugar machinery. Mr. HILHOUSE\* suggested that, given an equal remunerating value, the first 500 roods of a coast estate should be planted with cotton, the second with canes and the back with coffee and plantains. Canes being inadmissible and the prospects of cotton by no means encouraging, the only cultivable product to be adopted is coffee, and this as he says will only do well on the back lands. There would be no real difficulty in growing coffee provided the capital could be raised, but it is doubtful whether it would not be better and cheaper in the end to abandon the coast altogether, and buy land on the Canals or within ten miles of the mouths of the rivers, on their banks. At all events it would mean ruin to the present estate-owners.

Under the old system the planting of a sugar estate with cotton or coffee meant but a small loss, for the horse-power mill and coppers were of little value com-

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\* Page 33 ante.

pared with the plant of such an estate as *Diamond* and *Nonpariel* to-day. The very fact that perfection in sugar making has been the goal of the planter for many years past will make the downfall all the greater. Those capitalists who have lost on sugar are not likely, even if they had the money, to try another investment in coffee, which might be ruined if Brazil chose to adopt a bounty system.

What then can be done? Let the colony go to ruin or give it a little assistance? The free trade principle is undoubtedly right in theory, but can one country adopt it indiscriminately while others all round are bolstering up their industries to be able to compete with the free traders? It is an old adage that there is no rule without exception, and we believe that the present crisis of the sugar colonies indicates a condition which makes a measure of protection desirable to save them from impending ruin. The British voter, no doubt, cares little or nothing for the West Indian, as long as he gets cheap sugar, and anything that will raise the price of that necessary article will naturally be opposed. If the British Government however would only relax the free-trade principle a little, to save the sugar colonies from perishing, we believe that a bounty could be given without difficulty.

In round numbers the imports of sugar into the United Kingdom amount to about one and a half million tons per annum, of which supply we may credit the British Colonies with one-fourth. Now, to prevent difficulties in connection with commercial treaties it would be necessary, were a duty imposed at all, that it be uniform, and we would suggest that eightpence per hundred weight be imposed for the purpose of raising the fund necessary to give the sugar colonies a bounty. This im-



post would be so small as to be hardly felt by the consumer, yet it might be sufficient to give our planters a bounty of two shillings per cwt., or even 2s. 8d., *i.e.*, a return of the duty paid as well. In warfare it is sometimes necessary to fight the enemy with his own weapons; the fiscal arrangements of most countries take this into account. The above would certainly be quite a fair arrangement, and we cannot see how any of the continental nations could object to it, although they certainly would oppose anything like a countervailing duty.

Unless something is done British Guiana will probably pass through a similar crisis to that experienced in the decade between 1840 and 1850. The ultimate results may not be altogether evil, yet the pain, trouble and misery of such a downfall will be most distressing. When we remember that after the emancipation some of the roads became so impassable that the mails were often stopped, and see what a drawback the want of regular communication throughout the colony would be now, it almost makes us despair. From the rise of sugar we can date all progress, and, although some are inclined to expect great things from gold, it is doubtful whether anything like permanent benefit can be derived from it. The industry may perhaps assist the colony for some time to come, but, without some agricultural product, there can be nothing like prosperity. Is it not a fact that most of the capital used in that industry was obtained through sugar? And, is it not also a fact that the late depression in our staple is being felt in the diggings and is largely responsible for their stagnant condition?

## ***The Results of Recent Scientific Researches into the Agricultural Improvement of the Sugar Cane.***

***By J. B. Harrison, M.A., F.I.C., F.G.S., F.C.S., Etc., Government Analyst.***

**U**NTIL within the last fifteen years all attempts to improve the agricultural yield of the sugar cane by the application of modern methods of scientific research appear in English Colonies to have been limited to the growth of varieties of sugar cane in the Government Botanic Gardens of Mauritius, Jamaica, Trinidad and Queensland. The Botanists in charge of these institutions based their recommendations to planters as to the adoption of one or other variety, simply on the appearance of the growth of the plant, its freedom from visible signs of certain diseases, and its greater or less immunity from attacks by moth borers and other insect pests. Occasionally we find that the degree Baumé or the degree Arnaboldi or some other equally vague mode of recording the specific gravity of the expressed juice of the cane was employed, whilst the highest requirements of science appear to have been considered as fully met when, in addition to the colour and other morphological characteristics of the canes, the percentage of expressed juice together with its specific gravity was recorded. In foreign countries and colonies a very similar state of affairs existed, although in some of them, for instance Java, the scientific knowledge of the agricultural requirements of the sugar cane and of the agricultural value of many of its varieties was considerably in

advance of that in the British colonies; although our colonies working on the classical British system of agriculture,—profiting by the expensive mistakes and the accumulated experience of our forefathers, whilst neglecting or not fully profiting by the results of modern agricultural research,—produced probably higher yields of canes per acre than did any of their competitors, with the exception of the extraordinary yields of from seven to ten tons of sugar per acre reported from time to time as being attained by the cultivation of the Lahaina (Bourbon) cane in the Sandwich Islands.

I purpose this afternoon, as far as I can in the brief limit of a paper, to bring before the members of the Royal Agricultural and Commercial Society, in a popular form, the results obtained in recent years by applications of science in the field and the laboratory towards increasing the agricultural yield of the sugar-cane. I shall confine myself wholly to the agricultural side of the question, this society possessing many members far better qualified to speak upon the manufacture than I can be, and I will bring before you the subject which we are about to discuss arranged under the following heads :—

1. The search for improved varieties of sugar cane.

- (a) by the examination of varieties obtained from other countries.
- (b) by “ bud variation.”
- (c) by “ grafting.”
- (d) by selection of tops for planting from canes of high saccharine strength.
- (e) by raising new varieties by means of the seed of the cane.

2. The improvement of the agricultural yield by means of manures.

1. *The search for improved varieties of sugar cane.*

By improved varieties are meant varieties yielding more sugar per acre than does the Bourbon, the White Transparent, the Purple Transparent or the Red Ribbon cane in the countries where either of them is the staple variety, and this may be attained in the following ways:—

1stly, by increase in the tons of canes produced per acre.

2ndly, by increased contents of sucrose in the canes.

3rdly, by both increased saccharine contents and increased weight of canes produced per acre.

4thly, by freedom of the canes from the diseases attacking them in the different countries.

M. J. KRAJENBRINK, in Java, in 1860, pointed out some of these desiderata in terms well worthy of reproduction, and which are as follows:—

1st. Can we increase the richness of the cane juice represented by the proportion of crystallisable sugar contained in one gallon, without at the same time diminishing the proportionate quantity of juice yielded?

2nd. Can we obtain finer and stronger canes without diminishing the quantity of the juice or its saccharine richness?

3rd. Can we obtain a larger number of canes to each stool without injury to their development, and without injuring their richness in juice or sugar?

Before entering into this branch of our subject it will be as well to consider what are the amounts of sucrose present in sugar canes of normal growth, as it is to the highly exaggerated ideas prevalent regarding the

saccharine contents of the sugar cane, and which, although well known to be incorrect by the great majority of planters engaged in the sugar industry in places where modern methods have been adopted, are still frequently given as correct in works claiming to be authoritative, and form the basis of newspaper articles which state, as though giving facts beyond the possibility of contradiction, that we are only getting from one-third to one-half of the sugar out of the cane which it contains.

About 1790, DUTRONE in his *Histoire de la Canne* pointed out that the sugar cane contained three kinds of juice, "one aqueous, another saccharine and the third mucous," and with this statement the matter rested for very many years,

The next enquirer into the saccharine contents of the sugar cane, as far as I can find recorded, was Mr. THOMAS KERR, then a planter in Barbados, afterwards Governor of the Falkland Islands, who carried out a series of experiments on fractional crushings of sugar canes in March 1852, in which he found that the sugar contents of the residual juices was always less than that of the expressed juice; and these results were explained by Dr. J. D. MAYCOCK, as due to the juice in the sap vessels probably not being so rich in sugar as that in the cellular tissue, and that the walls of the former being very much stronger than those of the latter resist a power which crushes the latter and expresses the juice from it. Dr. ICERY of Mauritius in his well known "Researches on the juice of the Sugar Cane," apparently unaware of the investigations which I have alluded to, after stating that the question had never been studied, gives figures which he obtained in October, 1864, showing that the additional juice yielded

by an increase of pressure contained distinctly less sucrose than did the juice first expressed, and explains this on practically the same grounds as those on which Dr. MAYCOCK had in 1852. In the early eighties, Dr. WILEY, Chief Chemist of the Department of Agriculture of the United States, again noticed and drew attention to this fact. But in the face of these repeatedly published results, the normal composition of the sugar cane remained in the text books at 18 per cent. of sucrose with occasional wanderings of from 16 to 24 per cent. It was reserved for the able chemist who was my predecessor in my present post to first appreciate the bearing of these facts on the true saccharine contents of the sugar cane, to be, in his Annual Report for the year 1883, the first to publish accurate analyses of sugar canes, and to supply in his paper read before this society on June 11th, 1885, unimpeachable data showing that the sugar cane does not contain anything like the proportions of sucrose it had usually been credited with, and that, instead of containing from 18 to 21 per cent., it seldoms contains 16 per cent., whilst the average amount of total sugars present in canes grown in this colony is only 14 per cent. or even less. We now know that the Bourbon canes of this colony contain on an average about 13 per cent. of sucrose, that Bourbon canes grown in Barbados contain on an average 14.5 per cent. of sucrose, and that the varieties White Transparent, Purple Transparent and Red Ribbon Canes may contain from half to one per cent. more than the Bourbon does when grown under similar conditions, and that there are no satisfactory reasons, for considering that these results are widely departed from in excess in any part of the world.

*(a) Varieties obtained from other countries.*

This line of research is doubtless the earliest one which was followed, for we find that as far back as the time of the mutiny of the *Bounty*, the West Indian Planters were on the outlook for better varieties, and imported into the West Indies, the Bourbon, the Purple Transparent, the White Transparent, the Red Ribbon, the Green Ribbon and probably the Violet Ribbon varieties from the islands of the Pacific and Indian Oceans to replace the old Brazilian cane, a few of which latter still linger in our cane-fields and are known as Creole or as Native canes. We find it recorded that from time to time interest in these and other varieties increased and decreased in the West Indies, but that more interest in this matter was apparently always taken in Java, in Mauritius and in Queensland than in these western colonies. In Java for instance, in 1860, M. J. KRAJENBRINK made a careful series of experiments with nine varieties of canes, a report of which is to be found on P. 193 of Vol. ii. of the *Sugar Cane*. In the British West Indies, Jamaica set the example of systematic cultivation of varieties of canes in the Government Botanic Gardens, followed by Trinidad, then by this colony and later by Barbados. But, as I have already mentioned, in the first two of these colonies the interest taken in the varieties by the Government Botanists merely extended to their morphological characters and occasionally to the yield of juice; an excellent example of which system may be found in Dr. MORRIS' report on his Department in Jamaica for 1884. The planter was left to ascertain by experiment on a large and costly scale as to whether or not some variety would give as good results with his former staple kind and necessarily

in the great majority of cases, the planters' experiments proved not only costly but unsatisfactory in the extreme. Some of us will doubtless recollect the times when Mr. A. would plant a few acres of Salangor canes in the hopes of getting better field returns and richer cane juice; how these Salangor in some years flourished and raised hopes of heavy returns of sugar; how in others they unaccountably languished; but how, whether they flourished or languished, one thing invariably characterised them—miserably poor juice and consequent loss of money. Or again misled by their size planters grew a few acres of the Elephant cane, or of the Po-a-ole under one or other of its synonyms; results the same,—juice of low saccharine strength sometimes less than 1 lb of sucrose to the gallon, loss of money and time to the planters, and of faith in attempting to improve his returns by planting improved varieties; all of which would have been saved if to the aid of the purely botanical experiments the assistance had been called of the chemist and of the scientific agricultural expert.

But in this colony and in Barbados from the commencements of the experiments with varieties different systems were adopted. Here systematic analyses were made each year and published in either the report of the Government Laboratory or in that of the Botanic Gardens, and as I have already pointed out, these analyses were the first published showing the actually true composition of sugar canes. Until 1888 only the composition of the canes were determined, but in that year and since the yield per acre of each variety has been ascertained, and we now have recorded and published the complete results of nine crops. In Barbados, the varieties under examina-



tion have always been grown in such a manner that the yields per acre and the compositions have been ascertained.

In addition, in this Colony, MR. JENMAN set himself the task of reducing to some order the state of confusion which then prevailed and which still in most cane growing countries characterises the nomenclature of varieties of canes. This has been done so successfully that 120 so-called varieties received at the Botanic Gardens have been gradually resolved into forty-two actual varieties. Unfortunately a similar course has not been adopted in the other English sugar producing colonies. In Louisiana, however, attempts have been made by DR. STUBBS with some success to elucidate the synonyms of varieties of canes in use in different countries. The synonyms of the more important varieties as determined at the Botanical Gardens or in Louisiana are as follows :—

*Bourbon.*—Otaheite, Loucier, Portier, Lahaina, Bamboo ii., China ii., Colony Cane, Cuban.

*White Transparent.*—Caledonian Queen, Mamuri, Rappoe, Hope, Light Java, Cheribon, Crystallina, Rose Bamboo, Blue Cane, Light Purple.

*Purple Transparent.*—Black Java, Louisiana Purple, Meera, Blue Cane, Dark Purple, Queensland Creole.

*Red Ribbon.*—Mexican Striped, Batavian Striped, Louisiana Striped, Seete, Striped Singapore.

*Green Ribbon.*—Malay, Brisbane, Green Rose Ribbon, White Striped Bourbon.

*Po-a-ole.*—Altamattie, Purple Mauritius, Cavengerie, Giant Claret.

*Mani.*—Norman.

The yields of the varieties have been determined

during nine crops at the Botanic Gardens, and the following are the results obtained with some of the better varieties :—

|                    |     | Tons of<br>canes per acre. |     | Equivalent yield of<br>1st. & 2nd sugars. |
|--------------------|-----|----------------------------|-----|---|
| Bourbon            | ... | 28'55                      | ... | 2'54                                      |
| White Transparent  | ... | 28'9                       | ... | 2'57                                      |
| Mani               | ... | 30'75                      | ... | 2'46                                      |
| Kamba-Kamba-vati   | ... | 20'5                       | ... | 2'34                                      |
| Red Ribbon...      | ... | 23'8                       | ... | 2'30                                      |
| Po-a-ole           | ... | 30'6                       | ... | 2'29                                      |
| Tamarind           | ... | 24'05                      | ... | 2'21                                      |
| Chigaca            | ... | 26'5                       | ... | 2'20                                      |
| Sacuri             | ... | 23'5                       | ... | 2'18                                      |
| Purple Transparent | ... | 22'75                      | ... | 2'16                                      |

In Barbados the results over a similar number of crops are as follows :—

|                    |     | Tons of<br>canes per acre. |     | Equivalent yield of<br>1st & 2nd sugars. |
|--------------------|-----|----------------------------|-----|--|
| Bourbon            | ... | 31'8                       | ... | 2'81                                     |
| White Transparent  | ... | 29'2                       | ... | 2'67                                     |
| Red Ribbon         | ... | 27'4                       | ... | 2'62                                     |
| Purple Transparent | ... | 27'01                      | ... | 2'55                                     |

The larger yields are explained by the fact that in Barbados the experiments have been carried on only with plant canes, while here both plant canes and ratoons were included.

In Antigua somewhat similar experiments have been recently made, and the results taken from Mr. WATT'S reports are as follows :—

| Plants & Ratoons.  |     |     |     | Tons 1st & 2nd.sugars. |
|--------------------|-----|-----|-----|------------------------|
| White Transparent  | ... | ... | ... | 1'08                   |
| Purple Transparent | ... | ... | ... | 1'10                   |
| Bourbon            | ... | ... | ... | '93                    |
| Red Ribbon         | ... | ... | ... | 1'31                   |

It is evident that in Barbados and in British Guiana,

the relative values of the more important of the old varieties of the sugar cane are very similar, the Bourbon being the best, and being somewhat closely followed by the White Transparent, whilst in Antigua, where the annual rainfall is much lower than in either of the former colonies, as might be expected, the hardier varieties have given distinctly better results than the Bourbon. As far as the West Indian Colonies go, experiments with the older varieties of canes have not resulted in finding a more productive variety, on an average of years, than the Bourbon. But these experiments have not been wasted; they have served to point out that over a series of years the Bourbon in its yield is not so far ahead of the White Transparent as we were inclined to expect, and that the White Transparent is a far hardier cane and one more resistant to attacks of insect and fungoid pests than the Bourbon. In this colony I am quite satisfied that on many estates considerable advantages might be gained by the substitution of the White Transparent for the Bourbon on certain of the lighter soils aback, where the latter variety does not ratoon well.

Somewhat common in our cane fields is the Green Ribbon. I have been frequently struck here with the robust growth of stools of this cane amid Bourbon canes, and I am of opinion that it would be worth while for some planters to pick out canes of this variety and to grow a few acres of it for experimental purposes. It is a cane with an excellent record under the name of Green Rose Ribbon in the Australian colonies.

It is worthy of note that in the fifties M. ROST VAN TONNINGEN of Java, in treating about varieties of sugar cane arrived at the following four propositions which, in

my opinion, have been since fully confirmed by many experiments:—

1. That every (sugar cane) region is peculiarly adapted to the culture of one or other variety of cane, the causes of which science cannot accurately determine.

2. That we shall be led to false conclusions if we judge of the qualities of a variety of cane suited to a certain district, by the qualities shown by the same cane when transplanted into conditions of inferior culture.

3. That the sugar cane, like a great number of other vegetables, is improved by continuous careful cultivation.

4. That it is not always advantageous, and that it may be imprudent to replace on a large scale, in a given locality, a good variety of cane by another variety which gives better results in a different region.

*(b) By bud variation.*

Until recently this mode of attaining an improved variety of cane appeared to be a favourite one with the authorities at Kew. By “bud variety” is meant the production of a variety distinct from that of the parent cane by means of a shoot springing from an eye. As the search for these “bud variations” has been recommended by such high authority it is of some interest to ascertain on what grounds the assertion that “bud variation” occurs in the sugar cane is based. Neither Mr. JENMAN nor myself during our long individual experiences with the scientific observation of the sugar cane—experiences probably as extensive as that of any other scientific observers—have ever seen anything resembling a “bud variation” in the case of the sugar cane, and I think that we are justified in assuming that if such variation ever occurs it is only in exceedingly rare cases.

The first instance I can find recorded of the discovery of a bud variation occurs in the Report of the Royal Botanical Gardens, Mauritius, for 1869\* in which Dr. HORNE, the Director, wrote under the heading of *Ribbon Cane*. "On examining the plants of this cane at "Mon Plaiser" a plant was noticed producing green instead of striped canes. On further examination two other plants were found, one of which was producing striped canes from one eye, and green canes from another eye, both of which eyes belonged to the same piece of cane, while the other plant was producing both striped and green canes from one and the same eye." Now here appears to be an account of the authentic production of bud varieties noticed by an observer of high standing, but as far as I can find, no further notice was taken of the matter at the time, and I cannot definitely learn as to whether or not these apparent bud varieties were separately cultivated or lost. That, however, Dr. HORNE was fully satisfied of the correctness of his observations and that these varieties or others similarly obtained were probably preserved may be gathered from a letter which he wrote to the Director of Kew Gardens under date of December 9th, 1890, and from which the following is extracted:—

"I think it probable that more and better results will be obtained by good cultivation and by new varieties from bud sports. Of these last we have eight or nine in Mauritius alone, some of them are very fine canes and they are extensively planted. Most of them are hardier than their parents and yield more sugar. They are mostly obtained from new canes recently introduced.

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\* *Sugar Cane* Vol. ii. p. 673.

The sudden change of climate, soil and other circumstances cause them to be thrown off."

The weak point in the account lies in the statement that "they are mostly obtained from new canes recently introduced." Several instances have been found in the Botanic Gardens here and also elsewhere, where among canes springing from cuttings of varieties recently introduced, canes have been found differing from the bulk and an enthusiastic but superficial observer could easily have considered these to be bud variations. But almost without exception, when these were cultivated separately, they were proved to be other well-known, and in many cases, common varieties.

The next account of the reported occurrence of bud sports occurs in a paper read by Mr. MELMOTH HALL at a meeting of the Agricultural Society of New South Wales in either 1873 or 1874.\* In describing what is probably the Red Ribbon Cane he said:—

"I have reason to think that it is only a sport from the Otaheite cane or Vaihi, to which, in all respects but the colour of the cane it bears a strong resemblance. In support of this opinion I must state that I have, in one instance, seen no less than three distinct canes springing from one stool of the ribbon variety—one entirely yellow, another entirely green, the others being the usual ribbon canes, while from other stools in the same field I found canes either of a uniform green, purple or purplish brown, all the rest springing from the same ribbon cane root being striped in the customary way. The cuttings from these sports perpetuate the variety and have usually some distinctive properties such as rapidity of growth

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\* *Sugar Cane* Vol. vi. p. 524.

or sweetness of juice, notably so in the case of the yellow cane, about an acre of which I saw growing on Mr. RICHARD MEARS' property on the Hastings, at the time in possession of M. GEORGE MORRISON, a recent arrival from the West Indies—who assured me that it was the genuine Otaheite cane, from which indeed it was hardly to be distinguished. But subsequent inquiry convinced me that it had originated in a similar sport from the ribbon cane, than which it is said to be a good deal sweeter. I have discovered this disposition to “sport” in other kinds of cane, as for instance in the dark and light purple, from each of which I obtained permanent varieties of handsomely striped canes and which I named respectively Somerville's and Bale's ribbon, from the farms where I first saw them growing.”

In Queensland reports for some years after the date of this paper, reference is not unfrequently made to the yellow “sport” from the ribbon cane.

It is an interesting coincidence that the variety described as yielding bud sports by Dr. HORNE was probably the same as the one described by Mr. HALL.

In 1886 at Dodd's in Barbados, Mr. BOVELL discovered what he believed to be a bud sport among a plot of a variety of cane named “Naga,” a variety which had been received a short time previously from Jamaica. Personally I was never satisfied that this was a true sport. While I was in Barbados this “sport” closely resembled the variety from which it was obtained, the canes being almost identical in average size and giving a very similar weight of canes per acre. But later, judging from Mr. BOVELL's Reports, it underwent a remarkable

change and yielded very heavily. In consequence, we applied to Mr. BOVELL for plants of it which were duly received and planted in the Botanic Gardens. These gave us two varieties, one of which proved to be identical with the Naga, which we had under the synonym of Keening, while the other was shewn by repeated cultivation to be the White Transparent. Whether or not we received the true "Naga sport" we cannot say; if so the plants of it must have been mixed with White Transparent canes and ordinary Naga, and failed to grow. But recently I saw many fields of the so-called "Naga sport" ("Doddsii") in Barbados, Antigua and St. Vincent, and in each case, the majority of the canes were White Transparent canes.

The only other instance, which I am aware of, in which sports of this kind have been claimed to be noticed, is from Louisiana, and is described on page 379 of Bulletin, No. 14 (1891, Second Series), of the Louisiana Sugar Experiment Station, in the following words:—

"As an illustration of bud variation, three years ago some stalks of cane, partly white and partly purple, were selected from the field of SONIAT BROS.' Ochampitalas plantation. They were called by them bastard canes. The stalks were taken and planted as follows:—First row, the entire stalk; second row, the white joints of each stalk; third row, the coloured joints of each stalk. At the end of the season four distinct canes, as far as colour could direct us, were obtained. Types of the four new varieties were selected and separately planted and this year were found to be nearly pure. Selection and separate plantings were again made. These canes have been named as follows:—First, a white cane, No. 29,



Soniat, after the owners of the plantation ; second, a light striped, No. 59, Nicholls, after the Governor of our State ; third, a light purple cane, No. 64, Bird, after the Commissioner of Agriculture : fourth, a dark striped, No. 65, Garig, after the other member of the Board of Agriculture. These canes, except the white, are entirely different from any other cane in our collection."

It must, I think, be admitted that the evidence, so far as it is available, with regard to the occurrence of "bud" sports in the sugar cane, is somewhat meagre, but that, on the whole, it points to the occurrence of bud variation as a very rare manifestation on the part of the sugar cane. Hence, I do not consider that the improvement of the sugar cane by means of bud sports can be considered as a practical method, or one likely to repay the enormous amount of work necessary to search through many square miles of sugar canes in search of what, at the best, must be of extremely rare occurrence.

*(c) By the production of graft-hybrids.*

Attention has been recently directed towards the possibility of the production of new varieties of sugar canes by grafting canes of one variety with scions of another kind, by an assertion which appeared in the *Sydney Daily Telegraph*, that successful experiments had been made by grafting buds of a variety of cane upon stocks of a different variety which had resulted in the production of a hybrid combining in itself the properties of both parents. Those who have made a study of the literature of the sugar cane are aware that claims of this sort have been made from time to time, but that beyond the claim nothing afterwards has been heard of the discovery. Probably, this last claim would have speedily followed

its foregeners, if in the *Sugar Cane* for November last Mr. BARBER, late Director of Agriculture in the Leeward Islands, in an article entitled "Graft-hybrids of the Sugar Cane," after stating that practical planters "appear to have dismissed the matter rather unceremoniously as altogether unscientific" had not gone on to say "The method does not appear to have had adequate trial during recent years at the experimental sugar stations, and there are circumstances which would warrant more attention being paid to the process in sugar growing colonies." He then quoted a hitherto unpublished letter from the late CHARLES DARWIN to G. T. ROMANES dated January 1st 1881, relating to claims made by the Baron DE VILLA FRANCA and Dr. GLASL of Brazil that they had successfully produced graft-hybrids. Now, we must plead guilty to not having experimented in this manner, and certainly after discussion, Mr. JENMAN and myself agreed with the practical planters and "rather unceremoniously dismissed the matter as altogether unscientific." But beyond our own scientific knowledge we had good and definite reason for doing so; we have a file of the *Sugar Cane* and from time to time we consult it. Now in Vol. IX on pp. 315-519, 342-349 and 411-417 may be found a report, translated from the Portuguese, covering the whole of this matter, discussing the alleged cases of successful grafting, including those of the Baron DE VILLA FRANCA and those of Dr. GLASL, and this report is signed among others by Dr. GLASL himself. It will be sufficient for my purpose, which is to show that Mr. BARBER'S assertion that "there are circumstances which would warrant more attention being paid to the process in sugar growing colonies" is not on a

well founded base, to quote the conclusion arrived at by the Committee of the Imperial Agricultural Institute of Brazil appointed to enquire into the matter, of which Committee Dr. GLASL was the most prominent member, and which may be found on p. 417 of the *Sugar Cane* Vol. IX. :—

- “ 1. The real grafting of sugar cane does not exist.
2. Theory does not explain it, and facts do not confirm it.
3. All facts presented up to our time, as to grafts, appertain perfectly to the great field of morphological phenomena.”

These conclusions were arrived at after consideration of the alleged results of grafting by at least four methods, and actual examinations of the so-called grafted canes, and I think that under the circumstances you will agree that Mr. JENMAN and myself are not deserving of any great degree of censure for not attempting to graft a monocotyledonous plant. The production of improved varieties by graft-hybrids of the sugar cane, in my opinion, may, with all due deference to Professor BARBER, be dismissed as beyond the bounds of probability.

*(d) By the selection of tops for planting from canes of high saccharine contents.*

Many reflections have been cast at sugar cane planters from time to time by those whose knowledge of the plant has been almost entirely theoretical, for not selecting the tops for planting on account of their apparent vigour or of the high saccharine strength of the cane from which they are cut. Among others the Director of Kew Gardens has frequently called attention to this matter. But neither among practical planters nor among

the great majority of the scientific experts who are constantly engaged in the study of the plant have these recommendations received much support. The practical planter knows from long experience that a top derived from a small, hard, fully matured cane is far more certain to grow than one derived from a fine large but frequently immature cane. He is also well acquainted with the facts that the influences of soils and seasons govern the relative saccharine contents of the cane, and he has not found that tops obtained from canes grown in Barbados with a total sugar contents of from  $14\frac{1}{2}$  to 15 per cent have produced richer canes than tops from canes grown in the colony and containing only about 13 per cent of total sugars. This last experience has been many times repeated and on large scales. The scientific expert, aware of the facts upon which the practical planter relies, while he willingly admits that, if from some cause inherent in the cane itself, sports were produced of relatively high saccharine strength, tops taken from such sports would probably produce canes having the same property, can not admit that when a cane, from differences due to age, to position in the stool, or to soil or manurial conditions, becomes of saccharine strength above the average of its kind, there exists any likelihood of a cutting from the older or otherwise favoured shoot producing a new plant of saccharine richness above the average. That considerable differences do occur in the richness of individual canes is in accordance with the experience of all who have had cause to study the composition of the sugar cane, but such differences are almost invariably traceable to conditions of age or to conditions exterior to the plant. I do not deny that from time to time, from causes inherent to

the plant, "sports" may arise of canes richer in sugar contents than the average of canes of the same variety, but I believe this phenomenon to be probably as rare as is that of bud variation.

But these views are not held by all sugar cane experts, and among those holding different views Mr. HUBERT EDSON of Louisiana has the foremost place. He claims to have conclusively proved that by selection of canes for planting of saccharine strength higher than the average, a distinct increase in the saccharine contents of canes planted over wide areas can be obtained. From his report issued in 1893 it appears that in 1891 he planted two fields of canes, one with "rich" canes with juice containing 14.7 % of sucrose, the other with "poor" canes with juice containing 11.9 % of sucrose. From these he got as follows :—

|      | Rich Canes.      | Poor Canes. |
|------|------------------|-------------|
| 1891 | 11.2 o/o sucrose | 10.9        |
| 1892 | 16               | 15.1        |

and in another experiment where the rich canes yielded juice containing 19.5 % of total solids and that of the poor canes contained 17.2 % his results were :—

| Rich Canes.      | Poor Canes.       |
|------------------|-------------------|
| 13.9 o/o sucrose | 13.1 o/o sucrose. |

Mr. EDSON comments upon these results, after laboriously elaborating out theoretical yields from his figures that "It is undoubtedly a remarkable showing" while Mr. THISELTON-DYER alluded in terms of high approval to these experiments in his somewhat recent condemnation of the planters of this colony.

I do not think that practical planters, at any rate in this colony, share in the enthusiasm of Mr. EDSON and Mr. THISELTON-DYER. To me, the experiments, far from

proving what is claimed for them, appear merely to show that cuttings from canes of one kind, whether taken from either abnormally rich or abnormally poor individuals, tend to produce in their offspring, canes approximating to the normal richness of the variety. For we may notice that the standard of richness of the poor canes has increased more rapidly than that of the rich ones and an argument might easily be drawn from this that as if you select abnormally poor canes their offspring will be richer, you should plant a poor cane to get a richer. The differences are not sufficiently marked to enable it to be stated that a rich cane will tend to produce richer offspring than a poor one will. In fact they are not so great as would be occasioned by slight differences in the degree of maturity of the rows occasioned by minute soil differences such as the one mentioned by Mr. EDSON that the row from the poor seed "was nearer to the ditch than the other." Do practical planters require further proof of the unreliability of these results? especially when we read that the "poor" canes produced 6.5 per cent. more canes by weight. In his latest communication to the *Sugar Cane* last year Mr. EDSON maintained, without giving figures, the accuracy and importance of his results, and therefore we must assume that in the immature canes grown in sub-tropical climates the richness of the parent cane may possibly slightly affect that of its immediate offspring.

But does this hold good for the tropics? I have found some valuable experiments which, although not intentionally, bear upon this matter, in the reports of the Barbados Botanic Station. Several varieties of canes were planted in 1887, in some instances with plants received

from the Botanic Gardens of this colony and in others with the same kinds raised in Barbados. Mr. FRANCIS determined the sugar contents of those raised here, while I determined those of the canes raised in Barbados. In both cases the canes were at maturity when analysed. For several years these canes were grown side by side on the experimental fields and the following were the results in the percentages of sugar contained in the canes :—

## RICH PARENTS.

|             | Red Ribbon. | White Transparent. | Purple Transparent. | Bourbon. |       |       |
|-------------|-------------|--------------------|---------------------|----------|-------|-------|
| Parent 1887 | 14'04       | 15'39              | 15'89               | 15'30    | 15'07 | 13'96 |
|             | <hr/>       | <hr/>              | <hr/>               | <hr/>    | <hr/> | <hr/> |
| 1889        | 13'89       | 15'73              | 15'43               | 13'98    | 15'46 | 12'34 |
| 1890        | 13'14       | 14'61              | 14'13               | 13'53    | 13'66 | 13'44 |
| 1891        | 14'23       | 15'27              |                     | 15'24    | 14'28 | 13'33 |

## POOR PARENTS.

|             | Red Ribbon. | White Transparent. | Purple Transparent. | Bourbon. |
|-------------|-------------|--------------------|---------------------|----------|
| Parent 1887 | 13'53       | 13'68              | 14'83               | 12'90    |
| 1889        | 16'11       | 14'85              | 14'72               | 12'70    |
| 1890        | 13'13       | 14'51              | 13'66               | 14'04    |
| 1891        | 15'30       | 14'75              | 14'50               | 14'28    |

The averages of the three crops were as follows :—

|                             | Bourbon. | White Transparent. | Red Ribbon. | Purple Transparent. |
|-----------------------------|----------|--------------------|-------------|---------------------|
| Canes from rich parents ... | 13'04    | 15'07              | 13'75       | 14'36               |
| Canes from poor parents ... | 13'67    | 14'75              | 14'85       | 14'29               |

The only results which give the least support to Mr. EDSON'S experiments were those with the White Transparent.

The average of all of the results was as follows :—

|                             |       |
|-----------------------------|-------|
| Canes from rich parents ... | 14'05 |
| Canes from poor parents ... | 14'39 |

which does not in any way support the contention that

canes grown from richer parents will tend to be richer than those raised from poorer parents.

In addition, this experiment has been frequently repeated in this colony. Bourbon canes grown in Barbados are well known to contain on an average at least one and a half per cent. more sucrose than those raised here. On many occasions canes have been imported from Barbados and used here for planting. Now, if the contention of Mr. EDSON and Mr. THISELTON-DYER is correct, fields planted with tops from Barbados ought to have yielded decidedly richer canes than those planted with Demerara tops. Has this ever been the case? I can find no record of it; and with men so keenly alive to every point in their pursuit which promises advantage however small as are our planters, I am certain that if richer canes had been obtained the fact would have been noticed and the matter followed up. The universal opinion appears to be that no better results as regards the richness of the cane juice have been obtained from Barbados tops than from local ones.

From the foregoing grounds Mr. JENMAN and myself have not considered it worth while expending time, labour and money over attempts to obtain improved canes by selection of tops for planting.

*(e) By raising new varieties by means of the seed of the sugar cane.*

Until within the last ten years the idea that the sugar cane could produce fertile seeds was, by the great majority of planters and botanists, held to be absolutely without proof, and attempts to raise canes from seeds were considered to be as futile as I hold attempts to obtain "Graft hybrids" are. How this scientific and popu-



lar error arose it is difficult to tell. Some years ago, with the assistance of Mr. CARRUTHERS, the Keeper of Botany at the British Museum, I searched through a lot of old botanical works and we could find no trace of this belief, until about 1750 when HUGHES wrote his Natural History of Barbados. Nay, more, we found descriptions of the seed of the sugar cane so complete and accurate that CARRUTHERS considered they must take precedence of all recent work. Dr. DUTRONE in 1790 described the florescence of the cane as follows:—

“It's characters are these: it has no empalement, but a woolly down, longer than the flower that encloses it; the flower is bivalve; the valves are oblong, acute-pointed, concave, and chaffy; it has three hairlike stamina, the length of the valves, terminated by oblong summits, and an awl-shaped germen, supporting two rough styles, crowned by single stigmas; *the germen becomes an oblong, acute-pointed seed, invested by the valves.*” In figure 27 of the plate in PORTER'S work on the sugar cane the germen with its two styles and stigmas is shown.

In the report of the Barbados Botanic Station for 1889 I gave the local history of the knowledge of the production of fertile seeds of the sugar cane, and in a letter to the Manchester Examiner in September, 1890, I gave the history of the matter as far as I knew it. This letter was re-published in the Kew Bulletin and afterwards copied in “Sugar” for February, 1891. Since then I have come across a few instances showing that certain investigators in the Western tropics were aware of the occasional fertility of the seed of the sugar cane, for instance Baron

VILLA FRANCA, in April, 1869, wrote : " The floral parts of canes with some, although rare, polliniferous flowers and feminine organs concurred to produce species or new varieties," an exact statement of what we now know.

When in 1888, Mr. BOVELL and myself attacked this subject, it was not with the object of proving that the sugar cane could produce seed, as we had knowledge of previous successful experiments in the matter, but to find if from the seed of the sugar cane it was possible to obtain in considerable quantity seedlings of new varieties, some of which might possibly possess more desirable properties than do the present staple kinds. This object has been steadily kept in view ever since, and has been pursued in Barbados, in British Guiana, in Martinique, in Mauritius, to some extent in Java, and more recently in Trinidad, in Singapore and in Queensland. Progress in the work has been necessarily slow, and while, perhaps, caution has been the most marked feature of the work in this colony, still looking to the fate of the famed Burk cane, a seedling which was to do wonders, in Barbados, I cannot think our caution misplaced. This investigation has only been pursued on scientific lines since 1889, and I think that the facts that in this colony, in Java, and in Queensland, canes have been raised from seed having considerably higher sugar contents than the staple varieties shew, are most encouraging and should lead to increased activity in pursuing this line of research. Success in this appears to me to be the only likely opening for materially reducing the cost of sugar production in this colony where planters have already so fully availed themselves of the resources of mechanical and chemical science.

In Barbados, where this line of research was originated,

judging only from the published reports, the present investigators do not seem to have been successful in raising seedling varieties of exceptional saccharine strength. At any rate attention is not drawn to success in the reports, and from close examination of the tables I can find but little indication of it. Possibly the prevalence of diseases in the canes there, has affected the results prejudicially.

In this colony we have succeeded in raising several varieties having high saccharine contents, the most marked of which are Nos. 95, 74, 61 and 102, which have contained respectively during four crops 16.5, 16.2, 15.5 and 15.1 per cent. of sucrose. During the same period the Bourbon canes on the same land averaged 13.3 per cent. These varieties are all canes of a slighter build than the Bourbon but give more canes to the stool and, in addition, ratoon better. We have some varieties No. 78, 109, 145, 115 and 130, which are of about the same or are a little higher in saccharine strength than the Bourbon and which contained respectively 14.3, 14.5, 14.8, 13.8 and 14.2 per cent. of sucrose, and have given much higher yields of canes per acre. Also, we have raised several varieties yielding individual canes of great size, far in excess of that of any known kind, but, unfortunately, these have all been of low saccharine strength. We have not succeeded in obtaining, as yet, large sized canes of exceptionally high saccharine strength, but hope to do so in the future. That the high saccharine strength of some of these new varieties is a constant property is shown by the fact that the No. 95 cane grown in Louisiana had the same relatively high sugar contents as it had shewn in this colony.

The yield of the Bourbon at the Botanic Gardens was,

on the average of four crops, equivalent to 2·5 tons of all sugars per acre, while the new varieties produced as follows :—

|             |     |     |     |     | Tons of all sugars per acre. |
|-------------|-----|-----|-----|-----|------------------------------|
| No. 78 ...  | ... | ... | ... | ... | 3·62                         |
| No. 95 ...  | ... | ... | ... | ... | 3·37                         |
| No. 102 ... | ... | ... | ... | ... | 2·63                         |
| No. 74 ...  | ... | ... | ... | ... | 2·59                         |
| No. 109 ... | ... | ... | ... | ... | 3·03                         |
| No. 145 ... | ... | ... | ... | ... | 2·94                         |
| No. 115 ... | ... | ... | ... | ... | 2·83                         |
| No. 130 ... | ... | ... | ... | ... | 2·72                         |

These results, obtained on land not well suited to the growth of the sugar cane, are strongly indicative of the value of this new line of research.

From Queensland recently came a report of the high value of a seedling variety grown from seed obtained in 1889 from Barbados, and sown at Kew. From the published accounts this variety, which has been named "Kewensis," appears to contain about 15·7 per cent. of sucrose and to be of a prolific, heavy-yielding kind.

In Java a variety, No. 100, has been obtained containing about 15 per cent. of sucrose and of the future value of which considerable hopes appear to be entertained.

During our investigations in this colony we have studied the peculiarities of growth and development which characterise new varieties of canes raised from seed.

The principal of these are,—the very marked tendency to tillering characterising canes grown from seeds, which not unfrequently results in the production of stools having great numbers of canes in them, and the high glucose contents and low quotient of purity generally present

in the canes grown from seed ; these two characteristics do not descend from the original seedlings to canes raised from their cuttings ; the saccharine richness of the parent cane is no guidance to that of its progeny, nor is the relative richness of the parent variety ; the seedling variety does not appear to be affected as regards size by that of its actual parent, but is, in the majority of cases, governed by that of the parent variety ; that in the cases of self-coloured canes the majority of the seedlings more or less closely resemble in colour the parent variety, while in those of striped or ribbon canes the widest possible ranges of variation in colour, in size, and in saccharine contents occur. The best varieties for obtaining seed from in hope of getting better kinds appear to be the White Transparent and the Red Ribbon canes.

With many varieties the tendency among the seedling progeny is to deteriorate rather than to improve, and this is markedly more the case with varieties raised from the seeds of seedling kinds, many of which are remarkably prolific, than with varieties which for untold generations have been propagated only by cuttings. We have raised, to our disgust, many kinds of seedlings some of which have given canes, perfect canes which at their proper time arrowed, not thicker than a stout lead pencil, and others which resembled tufts of coarse grass with little or no tendency to form stalks.

It is very evident that with seedling varieties the kinds obtained are merely sports, the tendency to variation being so very wide that, in my opinion, it is almost useless to attempt improvement by artificial cross fertilisation or by raising plants from seeds of selected parentage.

This entails searching through very great numbers of seedling canes to select the better individuals, but on the other hand the chances of ultimate success are far greater from the marked tendency to variation than they would be if the seedlings came true to their parentage. Hence every additional investigator adds appreciably to our chances of improving the cane plant, if he uses care, judgement and, above all, caution, in making his selections.

The points to be aimed at in making selections of seedling kinds appear to me to be the following, in order of relative importance .—

1st, High saccharine strength.

2nd, Heavy yields per acre due to either

(a) heavy tillering ;

(b) large individual size ; or preferably to both.

3rd, Resistent power to attacks of moth-borer and its concomitant "rind fungus."

4th, Upright habit of growth.

5th, Absence of tendency of eyes to springing.

6th, Resistant power to attacks of cane rust.

7th, Light colour of stem and consequent light colour of juice which results in easier clarification during the manufacture of yellow crystals.

There are, of course, other points such as the presence or absence of cane itch, which will doubtless impress themselves on investigators.

*The Improvement of the Agricultural yield by means of Manures.*

Up to the present I have confined myself to the permanent improvement of the sugar cane by various means,

and I will now briefly treat of the temporary improvement of the yield by means of manures.

Using the term manure in a wide sense, we, in this colony, must include among manures certain substances whose action lies not so much on the plant as on improving the texture and condition of the soil. Of these the most important and, practically, the only feasible agent for us on a heavy clay land, is lime.

*Lime.*—Although very many experiments on the large scale have been made, especially in this colony, with lime, but very few results are on record. In fact, I can only find fully recorded those of the Colonial Company by Mr. SCARD and those at the Botanic Gardens. Privately Dr. STUBBS of Louisiana has informed me that he has used lime in very varying proportions on sugar cane fields but without any apparent benefit. I have known it used in Barbados and in St. Vincent with results which gratified the planter; I have also known it used in those islands with results which were productive to him of actual loss. But when one knows the differences which occur in the soils of those islands, the varying results are capable of easy explanation.

On the heavy clay soils of this colony lime would be expected to be a universally beneficent agent, but experience has shown that whilst in many instances its use has been attended with marked benefit, in others it has done little, if any, good, and its application has resulted in financial failure.

The Colonial Company from their published experiments appear to have applied lime at a rate costing \$7.00 per acre per annum, and taking all the results into consideration on land not manured, the lime produced an increase

of from 27'03 tons of canes per acre to 29'06 or 2'03 tons per acre per annum. Manures on land not limed gave an average yield of 28'8 tons, whilst on limed land the result was 30'1 tons, an increase of 1'3 tons per acre per annum due to lime. But an examination of the detailed tables shows that in some instances the average results over the five crops on the limed land were less than those of the not limed land, and as this was probably due either to soil or climatic conditions or to irregularities in the springing of the canes, I consider that if these were eliminated, the effects due to lime would be more accurately shown. Eliminating these results, there appears to be an average annual increase of 3'9 tons per acre on the unmanured land and one of 2'9 on the manured land.

Mr. SCARD'S results show strikingly how the effects of lime are modified by soil and climatic conditions, as the following were the average gains or losses apparently due to lime on each of the estates on which the experiments were continued during the five crops:—

|               |     |     |         |                               |
|---------------|-----|-----|---------|-------------------------------|
| Albion        | ... | ... | ...4'5  | tons per acre per annum gain. |
| Vreed-en-Hoop | ... | ... | ...3'3  | " " " " " "                   |
| Hampton Court | ... | ... | ... '4  | " " " " " "                   |
| Success       | ... | ... | ... '27 | " " " " " "                   |
| Friends       | ... | ... | ...1'27 | " " " " " loss.               |
| Mara          | ... | ... | ...4'51 | " " " " " "                   |

At the Botanic Gardens our experience has been in accordance with that of the Colonial Company at Albion and Vreed-en-Hoop. On the plots without manure we obtained:

| Tons of canes per acre. Increase due to lime : tons. |       |      |
|--|-------|------|
| Crop of 1892 not limed                               | 39'61 |      |
| Limed  | 46    | 6'39 |
| 1893 not limed                                       | 19'   |      |
| Limed  | 27'15 | 8'65 |
| 1894 not limed                                       | 16'8  |      |
| Limed  | 20    | 3'6  |
| 1895 not limed                                       | 11'35 |      |
| Limed  | 15    | 3'8  |



showing an average increase of 5'35 tons of canes per acre per annum due to a dressing of lime costing \$30.00 per acre when applied before the canes were planted.

On manured land we obtained :

|              |           | Tons of canes per acre. | Increase due to lime : tons. |
|--------------|-----------|-------------------------|------------------------------|
| Crop of 1892 | not limed | 47'85                   |                              |
|              | Limed     | 54'93                   | 7'06                         |
| 1893         | not limed | 31'35                   |                              |
|              | Limed     | 39'9                    | 7'75                         |
| 1894         | not limed | 24'15                   |                              |
|              | Limed     | 27'8                    | 3'65                         |
| 1895         | not limed | 20'15                   |                              |
|              | Limed     | 22'9                    | 2'85                         |

which shows an average increase of 5'08 tons of canes per acre per annum on the manured land as due to the liming.

On both not manured and manured land the dressings with lime, after paying the cost of the application, resulted in a profit of, in round numbers, \$18.00 per acre per annum. Hence we may safely conclude that on certain soils of this colony the application of lime results in largely increased yields of sugar cane. But it is not safe pecuniarily for a planter to at once proceed to lime his fields on a large scale. He should first experiment by liming alternate beds of one or more fields representing the general character of his land, and if he does not get a marked improvement, visible to the eye, of the limed as compared with the not limed breadths, he may conclude that liming will not pay on his land.

But my experience, and I believe that of other agricultural chemists in the colony, is that during years of low prices it is, on the whole, more economical to produce increased yields of canes by the action of manures rather than by that of lime ; although circumstances may from

time to time arise under which it may prove advisable to obtain the maximum yield from the fields by the combined use of lime and manures.

We found at the Botanic Gardens that the average annual excess yield of canes due to nitrogenous manurings, equivalent to 300 lbs. of sulphate of ammonia per acre, was 6·85 tons on the not limed land and 6·6 tons on the limed land ; thus—

|                       | Produce.                                  |
|-----------------------|---|
| Not manured ... ..    | ...21'7 tons of canes per acre per annum. |
| Limed only ... ..     | ...27'05 " " " "                          |
| Manured only... ..    | ...28'55 " " " "                          |
| Limed and manured ... | ...33'65 " " " "                          |

Or,

|                               |  |
|-------------------------------|--|
| Increase due to Lime...       | ... 6'65 tons of canes per acre per annum. |
| " " " Manures ...             | 6'85 " " " "                               |
| " " " Lime and manures ... .. | ...11'95 " " " "                           |

*Manures.*—From almost the first introduction of artificial and foreign manures into agricultural practice advantage was taken of them by sugar cane planters. When I first went to Barbados in 1879, I not unfrequently heard old planters boasting about the crops they had reaped in the forties, and bemoaning the falling-off in the quality of the guano imported into the island in 1878 and 1879 as compared with that which they had used when young men. As an instance of the early extensive use of foreign manures, in 1845, 5,054 tons of manure, valued at £36,961 were imported into Barbados, of which guano in value equal to £30,397 was received direct from Ichaboe. Unfortunately, whilst records may be found of the amount of guano imported in those early years, no records of experiments with it exist. About the first accounts of manurial experiments with the sugar cane are those of Mr. J. KRAJEN-

BRINK in Java, made in 1858 and 1859, and which are quoted at some length in the first and second numbers of the *Sugar Cane*. There we find recorded how a yield of 1·15 tons of sucrose per acre obtained without manure was increased by the use of guano to 2·4 tons, and by that of a mixture of oilcake, guano and ashes to 2·78 tons. Then we find a few trials made by M. DE JABRUN in Guadeloupe, quoted by VILLE in his work on artificial manures, and to which, together with some made in Reunion, allusions may be found in the pages of the *Sugar Cane*; but it was not until early in the eighties that systematic scientific manurial experiments were started in sugar cane growing countries. As regards scientific works treating upon the manuring of the sugar cane as based upon the ascertained requirements of other of the gramineæ, the first place both in order of priority of date and of merit, is held by the little pamphlet, published in 1865, by Sir JOHN BENNET LAWES, the principles enunciated in which are in fact our guides to this day. Then we find that elaborate advertisement of the merits of an agricultural nostrum—the Urban Sugar Cane Manure—written by Dr. PHIPSON and published by him under the misleading title of “Practical observations on Cane Manure” in 1870 in the *Sugar Cane*. This, which I believed had subsided into a well-deserved oblivion, has recently been dragged therefrom and republished by the Botanists—not by the Agricultural Chemists—in Jamaica and Barbados.

Since 1880 field experiments with the object of ascertaining the requirements of the sugar cane for the three principal elements of manurial plant food—nitrogen, phosphorus and potassium,—have been carried out in more

or less complete and scientific manners in several colonies and countries, among others, for instance, in Guadeloupe by BONAME, in British Guiana by the Colonial Company, in Barbados at the Dodd's Botanic Station, in Louisiana at the Sugar Experiment Station, in British Guiana at the Botanic Gardens, in Mauritius by the Station Agronomique and in Antigua by Messrs. WATTS and SHEPHERD at Skerrett's School.

With the exception of the last mentioned, the experimenters are all agreed as to the great importance of nitrogen in cane cultivation. In Guadeloupe, M. BONAME apparently aimed more at ascertaining the effects, if any, of the manures upon the composition of the juice of the canes than at the actions of the manures in increasing the yield of the plants. It is difficult to draw any reliable conclusions as to the specific actions of the various constituents of the manures used in the more recent experiments conducted by M. BONAME in Mauritius.

The investigations at the Sugar Experiment Station in Louisiana are far more satisfactory in their results. They clearly point out the paramount importance of nitrogen as a constituent of cane manure, the importance of phosphoric anhydride as a mineral constituent, and the fact that on soils such as the alluvial soils of Louisiana, potash is of little or no importance in manures for the sugar cane. Thus in the four crops reaped at Kenner, between 1886 and 1890 the following were the average results:—

|                                     |      |     |      |                              |
|-------------------------------------|------|-----|------|------------------------------|
| No manure                           | ...  | ... | ...  | 13'6 tons of canes per acre. |
| Mixed minerals...                   | ...  | ... | 13'5 | " " "                        |
| Mixed minerals and 24 lbs. Nitrogen | 20'  | "   | "    | "                            |
| " " 48 lbs. Nitrogen                | 21'7 | "   | "    | "                            |

Mixed minerals (superphosphate of lime and potash salts) applied without nitrogen gave no increase. Other series of experiments in which either phosphates or potash salts were applied to manurings yielding nitrogen and potash or nitrogen and phosphates respectively, shewed that whilst phosphoric acid was a necessary constituent of cane manures to obtain maximum effects, potash produced but little increase that could be traced to its direct manurial influence, and that the beneficial effects of both these constituents were far less marked than those of the nitrogen in the manures. Dr. STUBBS considered from the results of these experiments that phosphoric acid when used at or after planting should be in a soluble state, and that if insoluble phosphates were ever used they should be applied sometime in advance of the planting.

During the five years 1890-1894 at Audubon Park, confirmatory results were obtained; thus :—

|                                     |     |     |     |                              |
|-------------------------------------|-----|-----|-----|------------------------------|
| No manure                           | ... | ... | ... | 21.8 tons of canes per acre. |
| Mixed minerals and 24 lbs. Nitrogen | 27  | "   | "   | "                            |
| "                                   | "   | "   | 48  | "                            |
| "                                   | "   | "   | 28  | "                            |

This series of experiments loses much of its value from the fact that the land had to be first levelled, and thus whilst some parts were of fertility beyond the normal, others were of less fertility owing to the removal of much of the top soil.

The conclusions arrived at with regard to phosphoric acid and potash, as far as I can ascertain from the reports in my possession, were very similar to those deduced from the previous trials at Kenner.

During the experiments, trials were made with nitrogen derived from different sources, and the following shows

the average results of all the crops with the various manures :—

|  |     |      |                                 |
|--|-----|------|---------------------------------|
| No manure                              | ... | ...  | ...18.2 tons of canes per acre. |
| Mixed minerals and Sulphate of ammonia | ... | 26'  | " " "                           |
| " " " Cotton seed meal                 | ... | 24'2 | " " "                           |
| " " " Nitrate of soda                  | ... | 24'  | " " "                           |
| " " " Dried blood                      | ... | 23'  | " " "                           |

It is noteworthy that these experiments, which show a high rate of increase for nitrogenous manurings, were made with the Purple Transparent cane, a variety which at the Botanic Gardens has over a long series of years given a yield of only 22.75 tons per acre when receiving about 50 lbs. of nitrogen per acre in the manures applied.

The Barbados experiments were started a few months before the Louisiana ones, and were at first arranged for the purpose of deciding broad questions with regard to sugar cane manures, but after I left that colony the experiments were, in my opinion, unwisely, re-arranged and modified, in the hopes of settling what may be considered to be local matters of detail with regard to the constituents of cane manures and their application. Judging solely from the reports for 1891-1896, the experiments, adversely affected by drought and by the prevalence of disease among the canes, have completely failed in this object, and have, during these years, added comparatively little to our knowledge of the manurial requirements of the sugar cane.

In the four crops 1887-8-9 and '90 during which I was responsible for the arrangement of the experiments, the average annual yields of canes with and without nitrogen were as follows :—

|                          |      |                         |
|--------------------------|------|-------------------------|
| No manure                | 19'5 | tons of canes per acre. |
| Mixed minerals           | 25'3 | " " "                   |
| " " and 40 lbs. Nitrogen | 31'1 | " " "                   |
| " " and 80 lbs. Nitrogen | 34'1 | " " "                   |

and the following were the results using sulphate of ammonia and nitrate of soda as sources of nitrogen respectively :—

|                     |      |                         |
|---------------------|------|-------------------------|
| Nitrate of soda     | 27'4 | tons of canes per acre. |
| Sulphate of ammonia | 29'9 | " " "                   |

Over ten crops—1886 to 1895 both inclusive—the average yield with 60 lbs. of nitrogen as sulphate of ammonia was 30 tons per acre, and with an equivalent amount of nitrate of soda, 29'5 tons.

During the five crops 1891-1895 the fields without manure yielded an average of 23'2 tons per acre, those with mixed minerals one of 25'4, whilst the average yield of all the fields receiving nitrogen was 29'6 tons. With some difficulty I have drawn up from the reports the following, which gives the results of those experiments which have been repeated each year without material alteration in the proportions of the manures applied :—

|                                       |      |                         |
|---------------------------------------|------|-------------------------|
| No manure                             | 23   | tons of canes per acre. |
| Mixed minerals                        | 25'4 | " " "                   |
| Sulphate of ammonia, 40 lbs. Nitrogen | 29'2 | " " "                   |
| " " 60 lbs. " "                       | 30'2 | " " "                   |
| Nitrate of soda, 60 lbs Nitrogen      | 31'6 | " " "                   |

From 1887 to 1890 the plots manured only with nitrogen and potash salts yielded 31'6 tons of canes per acre per annum, these with phosphates in addition 33'9 tons. From 1891 to 1895 the plots without phosphates yielded 29'2 tons, those with 30'8 tons. About 2 cwts. of a 36 per cent. superphosphate per acre proved the most successful quantity to apply from 1887 to 1890, while, during the later years, 3 cwts. per acre gave the best results. But during the period from 1891-1896, slag phosphates applied in somewhat varying quantities gave an average increased yield of 2'5 tons of canes per

acre against .8 ton the average increase due to super-phosphate of lime. During seven crops, mineral phosphates in single and double dressings were experimented with, the average results being :—

|                             |                              |
|-----------------------------|------------------------------|
| No Phosphates               | 29.3 tons of canes per acre. |
| Mineral Phosphates (single) | 29.9 " " "                   |
| " " (double)                | 30.1 " " "                   |

showing that on the Dodd's soil mineral phosphates exerted but little action.

The following shows the effects of potash during the two periods :—

|                | 1887-1890.                   | 1891-1895.                   |
|----------------|------------------------------|------------------------------|
| Without Potash | 29.8 tons of canes per acre. | 26.2 tons of canes per acre. |
| With Potash    | 32.2 " " "                   | 31.2 " " "                   |

Here the plots without potash appear to be suffering from gradual exhaustion of the available potash in the soil. (The average amount of potash soluble in boiling hydrochloric acid in these soils in 1886 and 1887 was .1005 per cent.)

The experiments conducted by Mr. SCARD on behalf of the Colonial Company, in this colony, next claim attention. Unfortunately, these experiments, as is practically unavoidable with agricultural experiments made on extensive sugar estates, were conducted over comparatively large areas ( $\frac{1}{2}$  acre plots) and in consequence the results were adversely affected by variations in the fertility of the soils. In addition, the unmanured plots were not duplicated on different parts of the fields used, and thus no guidance was afforded to these soil differences. In all, the results of 858 manurial trials are given in the elaborate report published, and of these no less than 301 experiments gave results lower than those yielded by the control plots without manure. Mr. SCARD drew his



deductions from the consideration of the averages of all the results. Now, with all deference, I submit that it is not possible to average discordant results. I have therefore, for my present purpose, worked out the results, omitting the returns which were obtained on two estates over two crops only, and those on plots which on the average of the five crops gave results below those obtained on the corresponding not manured plots, and which, therefore, we may fairly assume to have been of markedly lower natural fertility than the control plots. In each case the increases have been calculated against the yields from the corresponding not manured plots and not against the average yields of all of them. The following are the results I have thus arrived at :—

| Manuring.  | No. of plot. | Average increase in tons of<br>canes per acre per annum on<br>limed and not limed plots. |
|--|--------------|--|
| Nitrate of soda $1\frac{1}{2}$ cwt.<br>24'9 lbs. nitrogen. | 1            | 5'83   |
| $1\frac{1}{2}$ cwt. superphosphate<br>25 o/o soluble.      |              |  |
| Nitrate of soda 3 cwt.<br>49'8 lbs. nitrogen.              | 3            | 6'02   |
| $1\frac{1}{2}$ cwt. superphosphate.                        |              |  |
| Sulphate of ammonia 1<br>cwt. 23'06 lbs. nitro-<br>gen.    | 4            | 6'65   |
| $1\frac{1}{2}$ cwt. superphosphate.                        |              |  |
| Sulphate of ammonia 2<br>cwt. 46'12 lbs. nitro-<br>gen.    | 5            | 5'62   |
| $1\frac{1}{2}$ cwt. superphosphate.                        |              |  |
| Nitrate of soda $1\frac{1}{2}$ cwt.                        | 2            | 5'49   |
| Superphosphate 3 cwt.                                      |              |  |
| Sulphate of ammonia 1<br>cwt.                              | 5            | 6'09   |
| Superphosphate 3 cwt.                                      |              |  |

These give us as the average annual increase, for in

round numbers, 24 lbs. of nitrogen with superphosphates, six tons of canes per acre, while the results with the double dressings of nitrogen are practically the same. From this it may be fairly assumed that the fields of the Colonial Company's estates were in too high a state of fertility to allow the canes to make use of the additional nitrogen. The nitrogen in the three plots with nitrate of soda produced increased yields at the average rate of 5.78 tons, whilst in those with sulphate of ammonia the excess yields were at the rate of 6.12 tons.

The arrangement of the plots did not permit of comparisons being made of the results with and without superphosphate of lime, but comparisons of the means of plots 1 and 4 and of plots 2 and 5 show that the effects of doubling the dressing of superphosphate was to somewhat reduce the yield of canes, the single dressing producing 6.2 tons of canes, the double 5.79 tons.

The results of manuring with 200 lbs. per acre of muriate of potash containing 105.7 lbs. of potash are best arrived at by comparison of the excess of yields on plots 8 and 9, the first of which received 400 lbs. of Ichaboe dissolved guano, the second the same, with the addition of the potash salts. Without potash the excess yield was 3.7 tons, with potash 3.2 tons, the heavy dressing of potash salts apparently acting deleteriously. This has with muriate of potash at times been remarked in other crops than the sugar cane and is possibly due to the excessive amount of chlorine supplied, acting as a check to vegetation. Personally since 1884, I have always recommended the use of either the sulphate or nitrate of potash as sources of potash for the sugar cane, in preference to that of the muriate, the greater probability of their favourable action

more than compensating for their relatively higher cost.

When the results of these experiments are considered in the manner I have adopted, the effects of mineral phosphates appear in an unfavourable light. Comparing plots 9 and 11 the first of which received nitrate of soda, superphosphate and the doubtful advantage of 200 lbs. of muriate of potash; the second, a similar quantity of nitrate of soda, with a light dressing of 112 lbs. per acre of mineral phosphates, the increased yields due to the manurings appear to be 3·8 and 2·8 tons respectively.

It is evident that this series of experiments, not only as it does when treated in the manner adopted by Mr. SCARD in his report, throws much light upon the probable financial results of the application of manures in the fields of the Colonial Company; but in addition supplies valuable indications of the manurial requirements of the sugar cane. Many of us are doubtless looking forward to the publication of the results, obtained by Mr. SCARD during later years, and I am certain that if he will be good enough to favour the Society with a paper upon them, it will be very highly appreciated by our agricultural members.

The manurial experiments conducted at the Botanic Gardens since 1891 were specially arranged to obviate, as far as we could, the effects of varying soil conditions. The results of these experiments may be found in detail in the Agricultural Report for the years 1891 and 1892, and in that for the year 1893-94 and 95 which has been recently issued, and copies of which are lying on the table for the use of members. Here I shall deal only with the general results obtained during the crops over which the experiments have extended.

The results with nitrogenous manures may be summarised as follows :—

|                                    |     |     |          | LIMED.                              |   | NOT LIMED.                          |   |
|------------------------------------|-----|-----|----------|-------------------------------------|---|-------------------------------------|---|
|                                    |     |     |          | Tons<br>of<br>canes<br>per<br>acre. | Tons<br>of<br>increase<br>due to<br>Nitrogen. | Tons<br>of<br>canes<br>per<br>acre. | Tons<br>of<br>increase<br>due to<br>Nitrogen. |
| Not manured                        | ... | ... | ...26'9  |                                     |   | 21                                  |   |
| Mixed minerals                     | ... | ... | ...29'9  |                                     |   | 22'5                                |   |
| Sulphate of ammonia 200 lbs. and   |     |     |          |                                     |   |                                     |   |
| mixed minerals                     | ... | ... | ...33'8  | 3'9                                 |   | 27'8                                | 5'3   |
| Sulphate of ammonia 300 lbs. and   |     |     |          |                                     |   |                                     |   |
| mixed minerals                     | ... | ... | ...33'95 | 4'05                                |   | 30'65                               | 8'15  |
| Sulphate of ammonia 400 lbs. and   |     |     |          |                                     |   |                                     |   |
| mixed minerals                     | ... | ... | ...36'4  | 6'5                                 |   | 31'3                                | 8'8   |
| Nitrate of soda 250 lbs. and mixed |     |     |          |                                     |   |                                     |   |
| minerals                           | ... | ... | ...34'   | 4'1                                 |   | 27'45                               | 4'95  |
| Nitrate of soda 375 lbs. and mixed |     |     |          |                                     |   |                                     |   |
| minerals                           | ... | ... | ...32'3  | 2'4                                 |   | 29'1                                | 6'6   |
| Nitrate of soda 500 lbs. and mixed |     |     |          |                                     |   |                                     |   |
| minerals                           | ... | ... | ...33'7  | 3'8                                 |   | 29'4                                | 6'9   |

Experiments using 40 lbs. of nitrogen per acre derived from two sources :—

|                                |     |     |         |         |       |       |      |
|--------------------------------|-----|-----|---------|---------|-------|-------|------|
| Not manured                    | ... | ... | ...27   |         |       | 21'6  |      |
| Mixed minerals                 | ... | ... | ...29'9 |         |       | 22'5  |      |
| Sulphate ammonia $\frac{1}{2}$ | ... | ... | ...     | } 32'25 | 2'35  | 28'15 | 5'65 |
| Nitrates $\frac{1}{2}$         | ... | ... | ...     |         |       |       |      |
| Dried Blood $\frac{1}{2}$      | ... | ... | ...     | } 29'05 | loss. | 27'45 | 4'95 |
| Nitrates $\frac{1}{2}$         | ... | ... | ...     |         |       |       |      |

In addition to these there were other experiments in which 40 lbs. of nitrogen in the forms either of sulphate of ammonia or of nitrate of soda were applied in some cases without mineral manures, in others to land which had been manured with farmyard manure when the canes were planted. As the result of all the experiments using 40 lbs. of nitrogen in the form of either

sulphate of ammonia or of nitrate of soda, we found that this amount yielded approximately 6 tons of canes per acre on land which had not been limed. On limed land we obtained in round numbers  $5\frac{1}{2}$  tons of canes by the use of 40 lbs. of nitrogen. In the experiments where mixed minerals were used on not limed land with nitrogen, 60 lbs. of the latter in the form of sulphate of ammonia, about 50 per cent greater increases of canes were obtained than with 40 lbs., while the highest rate of manuring with 80 lbs. showed a decided falling off in the rate of increase. Where the land had been limed the increase obtained by manures supplying over 40 lbs. of nitrogen per acre rapidly declined, and this was probably due in part to the large amount of soil nitrogen rendered available by the heavy liming.

These experiments fully corroborated those of the Colonial Company with regard to the relative agricultural values of nitrate of soda and sulphate of ammonia, these proving practically the same when used in quantities capable of supplying not more than 40 lbs. of nitrogen per acre. The physical disadvantage of liability to deliquescence in this humid climate, and the extra costs of carriage and of application of nitrate of soda, lead to the conclusion that, as a rule, the more satisfactory results, from a pecuniary point of view, should be obtained by the use of sulphate of ammonia.

The experiments indicated  $2\frac{1}{4}$  to  $2\frac{1}{2}$  cwts. of sulphate of ammonia per acre as the most certainly profitable rate of application on soils of similar character to those of the Botanic Gardens. Possibly the most satisfactory results would be obtained by the use of a mixture of 100 lbs. of nitrate of soda and 200 lbs. of sulphate of ammonia

per acre. Mr. SCARD concluded that 2 cwt. of sulphate of ammonia per acre gave the best results in the Colonial Company's experiments, so that with regard to nitrogen the conclusions arrived at in these two series of field trials in this colony are in practical agreement.

The results with phosphatic manures were as follows :

|  |     |     | Not Limed.                          |   | Limed.                              |   |
|--|-----|-----|-------------------------------------|---|-------------------------------------|---|
|  |     |     | Tons<br>of<br>canes<br>per<br>acre. | Increase<br>due to<br>Phos-<br>phates,<br>Tons. | Tons<br>of<br>canes<br>per<br>acre. | Increase<br>due to<br>Phos-<br>phates,<br>Tons. |
| Not manured                                      | ... | ... | 21'75                               |   | 26'2                                |   |
| Nitrogen and potash                              | ... | ... | 25'8                                |   | 32'25                               |   |
| Nitrogen, potash and 250 lbs. super-phosphate    | ... | ... | 26'85                               | 1'05  | 33'9                                | 1'65  |
| Nitrogen, potash and 275 lbs. super-phosphate    | ... | ... | 26'95                               | 1'15  | 33'                                 | '75   |
| Nitrogen, potash and 500 lbs. super-phosphate    | ... | ... | 28'45                               | 2'65  | 33'1                                | '85   |
| Nitrogen, potash and 400 lbs. mineral phosphates | ... | ... | 25'50                               | nil   | 31'6                                | nil   |
| Nitrogen, potash and 800 lbs. mineral phosphates | ... | ... | 27'30                               | 1'5   | 32'75                               | '5  |

The results on the crop of plant canes were :—

|  |     |     |       |      |       |      |
|--|-----|-----|-------|------|-------|------|
| Not manured                                      | ... | ... | 38'8  |      | 43'8  |      |
| Nitrogen, and potash                             | ... | ... | 41'1  |      | 52'2  |      |
| Nitrogen, potash and 250 lbs. super-phosphate    | ... | ... | 45'15 | 4'15 | 56'1  | 3'9  |
| Nitrogen potash and 375 lbs. super-phosphate     | ... | ... | 47'2  | 6'1  | 56'2  | '4   |
| Nitrogen, potash and 500 lbs. super-phosphate    | ... | ... | 48'95 | 7'85 | 53'55 | 1'35 |
| Nitrogen, potash and 400 lbs. mineral phosphates | ... | ... | 43'55 | 2'45 | 52'5  | '3   |
| Nitrogen, potash and 800 lbs. mineral phosphate  | ... | ... | 44'05 | 2'95 | 50'85 | nil. |

The advantages apparently due to the additions of

phosphatic manures to dressings of nitrogen and potash were almost entirely confined to the crop of plant canes, the impracticability of supplying sufficient tillage to render the soil pervious enough to allow the phosphatic manures to penetrate into the immediate vicinity of the roots of the ratoon canes probably accounting for this. Probably, the most profitable method of using phosphatic manures to the sugar cane in heavy clay land would be to apply to young cane plants about 3 cwt. of superphosphate of lime or, perhaps, preferably 6 to 8 cwts. of slag phosphates to the acre, and, in places, potash salts, in addition to after dressings of sulphate of ammonia and to dress ratoons with nitrogenous manures only.

The applications of mineral phosphates, both on plants and ratoons, were attended by unsatisfactory results.

In another series of experiments the following resulted :

|                        |                                | Land not limed. |                    |
|------------------------|--------------------------------|-----------------|--------------------|
|                        |                                | Tons of canes   | Increase due to    |
|                        |                                | per acre.       | phosphates (tons). |
| Nitrogen and potash... | ...                            | 15'35           |                    |
| Nitrogen potash and    | 250 lbs. superphosphate        |                 |                    |
|                        | each year...                   | 15'3            | nil.               |
| "                      | " " 1,000 lbs. mineral phos-   |                 |                    |
|                        | phates to plant canes..        | 14'85           | nil.               |
| "                      | " " 1,000 lbs. slag phosphates |                 |                    |
|                        | to plant canes                 | 16'1            | '75                |

In this series of experiments (with Transparent and Ribbon canes) the use of slag phosphates gave the best results.

Two series of comparisons of results with and without potash were arranged, in the first of which sulphate of potash was added to manurings of sulphate of ammonia and superphosphate, while in the second, nitrate of

potash in equivalent proportions was substituted in the manures for nitrate of soda. The results were as follows :

| SULPHATE OF POTASH.          |     |     |     | NOT LIMED.              |                               | LIMED.                  |                               |
|------------------------------|-----|-----|-----|-------------------------|-------------------------------|-------------------------|-------------------------------|
|                              |     |     |     | Tons of canes per acre. | Increase due to potash. Tons. | Tons of canes per acre. | Increase due to potash. Tons. |
| Not manured                  | ... | ... | ... | 22'65                   |                               | 27'95                   |                               |
| Nitrogen and superphosphate  | ... | ... | ... | 31'9                    |                               | 36'5                    |                               |
| Nitrogen, superphosphate and | 50  |     |     |                         |                               |                         |                               |
| lbs. potash salts            | ... | ... | ... | 32'4                    | '5                            | 35'75                   | <i>nil.</i>                   |
| Nitrogen, superphosphate and | 100 |     |     |                         |                               |                         |                               |
| lbs. potash salts            | ... | ... | ... | 32'7                    | '8                            | 35'5                    | <i>nil.</i>                   |
| Nitrogen, superphosphate and | 150 |     |     |                         |                               |                         |                               |
| lbs. potash salts            | ... | ... | ... | 32'95                   | 1'05                          | 35'85                   | <i>nil.</i>                   |
| NITRATE OF POTASH.           |     |     |     |                         |                               |                         |                               |
| Not manured                  | ... | ... | ... | 21'6                    |                               | 27'                     |                               |
| Nitrate of soda              | ... | ... | ... | 28'1                    |                               | 33'5                    |                               |
| Nitrate of potash            | ... | ... | ... | 28'05                   | <i>nil.</i>                   | 31'95                   | <i>nil.</i>                   |

The increases on land not limed due to the action of the sulphate of potash were small, and, on the whole, of very doubtful profit, whilst the absence of any increase where nitrate of potash was substituted for nitrate of soda causes us to pause in attributing the increases to the potash of the manures.

In Antigua for some years past, manurial experiments, have been conducted by Messrs. WATTS and SHEPHERD, at Skerret's School, with results which in one important point are in direct conflict with the majority of recorded experiments. Their results tend to show that the soil in which they worked contained sufficient available nitrogen for the needs of the cane plant, additions of nitrogen to plant canes either as sulphate of ammonia or as nitrate of soda being apparently either without effect or else injurious. Mr. WATTS shows that on an average



of six experiments with plant canes, making in each nine comparisons with and without nitrogen, the manures containing nitrogen yielded in round numbers  $2\frac{5}{8}$  cwts. *less* sugar per acre than did manures consisting only of phosphates and potash. Similarly on this curious soil the addition of phosphates, whether soluble as in superphosphate, available but not soluble in pure water as in slag phosphate, or insoluble and practically inert as in mineral phosphates, has reduced the yield of sugar; manures with phosphates having given in round number 4 cwts *less* sugar per acre than manurings with nitrogen and potash gave. As an example of these results, the average returns obtained in 1896 may be quoted:—

## Nitrogen experiments.

Tons of canes per acre.

|                |     |                                     |     |      |
|----------------|-----|-------------------------------------|-----|------|
| Not manured    | ... | ...                                 | ... | 21.1 |
| Mixed minerals | ... | ...                                 | ... | 26.1 |
| "              | "   | and nitrogen as sulphate of ammonia | ... | 24.5 |
| "              | "   | " as nitrate of soda...             | ... | 24.  |

## Phosphoric acid experiments.

|                                      |     |                    |     |      |
|--------------------------------------|-----|--------------------|-----|------|
| Not manured                          | ... | ...                | ... | 23.9 |
| Nitrogen and potash                  | ... | ...                | ... | 28.8 |
| Nitrogen, potash and superphosphates | ... | ...                | ... | 24.2 |
| "                                    | "   | mineral phosphates | ... | 29.2 |
| "                                    | "   | slag phosphates    | ... | 27.4 |

But with ratoons in Mr. WATT'S experiments both nitrogenous and phosphatic manures appear to act, in what, I think, we are entitled to consider more normal ways. His average results in 1896 were as follows:—

## Nitrogen experiments.

|                |     |                                   |      |                              |
|----------------|-----|-----------------------------------|------|------------------------------|
| Not manured    | ... | ...                               | ...  | 11.9 tons of canes per acre. |
| Mixed minerals | ... | ...                               | ...  | 12.7 " "                     |
| "              | "   | and nitrogen in sulph. of ammonia | 16.7 | " "                          |
| "              | "   | and nitrogen in nitrate of soda   | 13.7 | " "                          |

## Phosphoric acid experiments.

|                                      |      |                         |
|--------------------------------------|------|-------------------------|
| Nitrogen and potash only             | 13'8 | tons of canes per acre. |
| Nitrogen, potash and superphosphates | 14'9 | " "                     |
| " " and mineral phosphates           | 14'  | " "                     |
| " " and slag phosphates              | 13'4 | " "                     |

Where using potash salts, the Antigua experiments are with plant canes in general accordance with those obtained in Barbados. Manures which contained potash during six series of experiments with plant canes, gave on the average  $2\frac{1}{2}$  cwts. more sugar per acre than did manures containing nitrogen and phosphates but no potash. The results in 1896 were as follows:—

## Plant Canes. Ratoons.

|                                 |      |                             |
|---------------------------------|------|-----------------------------|
| Not manured                     | 23'9 | 11'9 tons of canes per acre |
| Nitrogen and phosphates         | 24'5 | 17'9 " "                    |
| Nitrogen, phosphates and potash | 26'2 | 14'7 " "                    |

Here again we find an entirely different action upon plant canes and upon ratoons.

Mr. WATTS when using superphosphate of lime to plant canes noted that additional amounts of superphosphate resulted in decreased yields, not in increased ones. The Colonial Company's experiments, as I have already mentioned, indicated a similar action, and unfavourable effects were very noticeable during the first series of the Barbados experiments. The results in Barbados were as follows:—

|                                     |     |     |                               |
|-------------------------------------|-----|-----|-------------------------------|
| Nitrogen and potash                 | ... | ... | ...31'6 tons of cane per acre |
| " potash and 2 cwts. superphosphate | ... | ... | ...35'1 " " "                 |
| " " " 3 "                           | "   | "   | ...33'4 " " "                 |
| " " " 4 "                           | "   | "   | ...31'7 " " "                 |

Effects of this nature at times noticed when manurings containing superphosphate of lime have been used to the sugar cane, indicate the necessity of caution regarding the amounts of it applied per acre.

It is of interest to ascertain the weights of canes which have been produced at different times in various places by the application of ten pounds of nitrogen per acre when accompanied by a sufficiency of the mineral constituents of plant food, either naturally present in the soil, or added by manures, and the following shows this :—

| Tons of canes per acre. |                   |           |          |                      |                     |            |
|-------------------------|-------------------|-----------|----------|----------------------|---------------------|------------|
| LOUISIANA.              |                   | BARBADOS. |          | BRITISH GUIANA.      |                     | ANTIGUA.   |
| Kenner.                 | Audubon.<br>Park. | Dodd's.   |          | Colonial<br>Company. | Botanic<br>Gardens. | Skerret's. |
| 1886-89,                | 1890-94,          | 1886-90,  | 1891-95, | 1882-87,             | 1891-95,            | 1891-96.   |
| 2'7                     | 2'15              | 2'65      | 1'55     | 2'5                  | 1'5                 | Nil.       |
| Average of nine crops.  |                   |           |          |                      |                     |            |
| 2'39                    |                   | 2'04      |          | 2'05.                |                     |            |

In tropical countries, except on such abnormal soils as the Antigua ones appear to be, we may fairly assume that over a series of years applications of sulphate of ammonia or of nitrate of soda, when applied in quantities not exceeding those which supply as much nitrogen as the sugar cane can make complete use of, will probably on the average result in a return of 2 tons of canes per acre for each 50 lbs. of sulphate of ammonia or 65 lbs. of nitrate of soda applied, and that, under specially favourable soil and climatic conditions, the return may amount to over 2'5 tons. Experience must with regard to each soil decide as to the amount of nitrogen which can be profitably employed.

From consideration of the results which have been obtained at these experiment stations, the following, in my opinion, may be fairly regarded as proved in connection with the manurial requirements of the sugar cane :—

1. The yield of canes per acre is governed by the

amount of readily available nitrogen either naturally present in the soil or added in the manures applied.

2. When applied in quantities containing not more than from forty to fifty pounds of nitrogen per acre, sulphate of ammonia and nitrate of soda are, on the majority of soils, equally effective as sources of nitrogen, but when the unit of nitrogen in these substances is of equal money value, it is, as a rule, more economical to apply the former rather than the latter. Dried blood and similar organic manures in which the nitrogen only slowly becomes available are of distinctly lower value as sources of nitrogen than the two above mentioned.

3. Under ordinary condition of soil and climate and the usual range of prices for sugar, it is not advisable to use more than 2 cwts. of sulphate of ammonia, or its equivalent,  $2\frac{1}{2}$  cwts. of nitrate of soda per acre.

4. If circumstances arise which render it desirable to obtain the maximum yield per acre by addition of nitrogen in quantities in excess of about 50 lbs. per acre, sulphate of ammonia ought always to be selected as the source of nitrogen.

5. Practically on all soils manurings with nitrogen require to be supplemented by applications of phosphoric acid. The most effective forms of phosphoric acid appear to be superphosphate of lime and slag phosphate meal. Mineral phosphates are of distinctly lower value and are not effective unless applied in quantities far in excess in value of those required of either superphosphate or slag phosphates. As a rule, the phosphates should be applied only to plant canes, their manurial action on ratoon canes being but limited.

6. On some soils the application of potash salts in

quantities of from 60 to 160 lbs. of sulphate of potash per acre results in greatly increasing the effectiveness of the nitrogenous manurings; while on many others, these applications have but little effect. Soils containing less than .01 % of potash, soluble in cold 1 % citric acid solution, will, as a rule, respond favourably when planted in sugar cane to manurings with potash salts. Soils having from .01 to .02 % of potash thus soluble may or may not be favourably affected by potassic manurings, while on soils containing more than the latter amount, the yield of sugar canes will usually not be increased by manurings with potash. In this colony the alluvial clay soils are, as a rule, so rich in potash that no marked increase in yield of canes can be expected from the use of potash salts. It is, however, worthy of notice that while the pegass soils of the colony generally contain fairly high proportions of potash soluble in hydrochloric acid, they frequently contain but traces soluble in citric acid solution, and upon them the use of potassic manures may, perhaps, be accompanied with benefit.

It is, perhaps, worthy of mention that the volcanic soils of the West Indian Islands differ from the extremely fertile soils of Hawai principally by their low contents of available potash, the soils of Hawai being even richer in this constituent than the alluvial soils of this colony.

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## *The Life History of an East Indian in British Guiana.*

*By the Rev. J. G. Pearson.*



THE perusal of a paper by the Editor of this Magazine\* calls up many many reflections in respect to 'The Life History' of each of the different races who make up our population. None, I think, are so unique and none so uniform as that of the "Indian" or Buck, and therefore it must be to that extent a harder task to produce any picture that shall be true in respect to anything more than a section of any other race which may be spoken of. In the first place the majority of the races except the negro are not yet at home here. The East Indian for instance, of whom I am thinking as I write this, is but the link between the race, as we know it in the East, and that we hope for in this corner of the West. He of whom I speak is commonly known as the Creole Coolie. Possibly he first saw the light while his parents were serving their time upon a Sugar Estate. If his father were at all prosperous, and his work 'paying work,' the first sounds that greeted his awakening faculties were those of gun-firing. Had baby been a girl her advent would have been undisturbed by gunpowder or noise, and the neighbours would not be expected to put themselves about to congratulate LUCHMAN upon the occasion of his wife's safe delivery. The East Indian seems to me pre-disposed to philosophy and it may be that he has arrived at the con-

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\* The Life History of an Indian, *Timehri* 1894, p. 138.

clusion—as he might very well do—from his observation of “the sex” that once in the world it needs no adventitious aid from “mere males” to make itself heard therein.

Baby’s mother SOFEE, being under indenture, might have had medical aid at the time of her accouchement, but she needed it not. A neighbourly granny midwife and perhaps a woman fellow-labourer did all she needed, and after a couple of days\* baby with a little cap with laps to cover the ears, if no other clothing upon him, might have seen SOFEE, had he interested himself in his surroundings sufficiently, as busy about household affairs as if nothing had happened. SOFEE now is very haughty for she has borne her lord a son. Other sonless women will envy her good fortune, and her “hubby” will idolize her above all else;—except baby. Baby, by this time named RAMPERSAUD, will be lord and master henceforth over both his parents. He will go with SOFEE when she returns to work—light work if the estate’s manager be a humane man—and work will have to play second fiddle at that. On Saturdays after pay-time and on Sundays, his father will carry him about, his pride and pleasure beaming over his whole countenance and bearing. Had LUCHMAN and SOFEE been Christians, baby would have been baptized by this time, had they been Mussulmans he would have been named with Mussulman rites, but being only a low caste Hindoo, they hit upon the name RAMPERSAUD, as that was SOFEE’S father’s name, and beyond giving a little feast to a few ship-fellowst and telling the sick nurse, when he insisted upon knowing,

\* Theoretically, the woman must not be about till the eighth or ninth day.

† Immigrants who come over from India in the same vessel.

what they proposed calling him, baby was named without ceremony. LUCHMAN did have an interview with one of his "country parsons" and paid a large price—for him—for a charm to hang round baby's neck. With this on it is hoped he will grow up healthy, industrious, and thrifty. It is said that Hindoos fear "Gods many and Lords many" and possibly this is so, but the real God they serve differs but little from the almost universal object of other men's care and thought, viz., mammon. The great difference is in this, LUCHMAN's idea of getting rich is to keep and conserve what he gets, while that of the majority of others consists rather in the ambition and effort to get more. LUCHMAN is not merely thrifty; he is absolutely mean. He has not been two years away from India, whence he came a veritable pauper, and yet he owns a cow and has something towards another hidden beneath the ground under his fire place in the corner of his room, or may-be in the Government Bank. At the age of two years, by which time RAMPERSAUD can walk and talk as well as European children at three, he is committed to the care of a granny who has charge of the *crèche*, with his little tin saucepan of boiled rice and callaloo or something equally tasty, to swing in a hammock or play about upon the ground while SOFEE is at work. Here, with scant attention—necessarily scant seeing the granny has twenty other babies to mind—RAMPERSAUD takes his first lesson in looking after "number one." He is not quarrelsome except in a very mild way and the robust methods of the children of sturdier races is quite foreign to him. Young as he is the characteristics of race shew themselves in him and what others get noisily and with much strife he secures by



craft. Like his parents he too inherits the philosophical strain. As the slow—to him—years of childhood creep by he hears wondrous tales of India and he wonders why his sapient parents ever left a country where commodities are so plentiful and rupees so scarce, to come to one where if the latter be more plentiful he cannot but think the former correspondingly difficult to procure. His parents frequently talk of the time when they will return to India, but he observes, as time slips by, and another and yet another cow is added to those for which his father pays agistment fees, and still more gold coins adorn his mother's breast, that the anticipatory pleasures this theme were wont to afford pale somewhat in the light of the actual prosperity and increasing comfort and importance of their present position. But, for many years "country" is a wonderful dream, gorgeous and grand in fact and possibility to RAMPERSAUD. By and by it is to him what Jack the Giant Killer and Alice in Wonderland are to our own children.

When too old to be left with the granny at the *crèche*, RAMPERSAUD spends most of his time playing about the negro yard. At tip-cat in its creole form, at marbles and at cricket—also in its creole form—he is an adept. His eye is true, his aim certain, and his every motion swift and deft. The only boys to beat him in these qualities are the Chinese. The black boys are no match for him in subtlety or skill but they have twice the staying power. Hence the strong tendencies of race are called into existence and the onlooker who has read East Indian history may see many a famous episode re-enacted on a small scale among the boys at play.

On one occasion his parents took him to town. Perched

upon his father's shoulder he viewed Georgetown with wonder and delight. SOFEE and one of the girls went too, and a happy party they were. The wonders of the Public Buildings, the railway, and the great stores and banks, afforded LUCHMAN something with which to compare the glories of dear Calcutta. RAMPERSAUD was hugely delighted and impressed, but the crowning point was the Museum, wherein he saw wonders many, including a real Bengal tiger. For days after his return home he was admired and sought after by all his companions. No tiger ever grew in size and ferocity as that tiger did according to RAMPERSAUD'S increasingly artistic accounts of him. But a more thrilling sight even than the tiger met RAMPERSAUD'S vision at the Museum, it was the sight of a man whose face was terribly disfigured. He told them his story; it was to this effect. He lived in a village far away from cities in one of the Northern States and his work morning and evening took him through unfrequented ways in which at dusk one evening he was attacked by a tiger but luckily for him some friends were near by and the tiger was scared off. This story sank deep into RAMPERSAUD'S mind and appreciably diminished the hankering he had felt at times to see his father's country.

Play however soon gives place to work, and at nine or ten RAMPERSAUD goes with the other urchins to assist manuring the sugar canes or to water them, as the case may be. He earns fourpence a day at this, which LUCHMAN carefully hoards. By and by when he has earned enough, another cow will be bought with the money. RAMPERSAUD never dreams of pocket money, for already his idea of the unpardonable sin is to part with money

for anything not absolutely necessary. His father sometimes on Saturday buys sugar-cake for RAMPERSAUD'S young brothers and sisters, but a very little goes far and it is a very good equivalent for food at the price, hence RAMPERSAUD'S susceptibilities are not roused beyond a severe frown.

At ten an important event takes place in RAMPERSAUD'S life of which he is the central figure. He has to be mated. A shipmate of his parents has a girl to dispose of, and a good deal of visiting and marching to and fro in a quiet way, at first mostly on Sundays, has to be accomplished before things pertaining to the disposal of the girl can be settled satisfactorily. Third parties of the "parson" order are very much to the fore, and much talk, interlarded—as far as the "parsons" are concerned—with many semi-religious aphorisms from the Holy books has to be listened to before details are reached. A little feast (in any case a meal) accompanies each of these functions. An outsider might think the girl's guardians most intractable and obdurate bargain makers, judging from the number of these visits to and fro, and the sum of state ceremony and etiquette entailed, but they are anything but that. LUCHMAN'S boy is healthy, good tempered, and has fair prospects, which is all the girl's parents care for, but custom and religion requires all this observance, at least the "parsons" say so, and LUCHMAN though he "says things" with a careless freedom begotten of living in such a free country as this, and under the direct influence of such Anglicising surroundings as obtain here, has nothing like the courage necessary to assert himself and send the "parsons" to the right about. More than this, something within him—be it hereditary

instincts, "fear of the Gods", or spiritual craving, demands religious observances in connection with this weighty matter. Then again not only have the women folk to be consulted and the estimation in which his fellows hold him to be considered, to which a row with the "parsons" would be disastrous, but some sort of binding compact out of the ordinary has to be made and sufficiently impressed upon the girl's parents. For, might it not happen that after all his expenditure a suitor better favoured (*i.e.* richer) than RAMPERSAUD might seek the damsel's hand, and what easier than a dispute purposely got up to end in an outright rupture. In this case, which might easily happen if the girls parents were under no religious dread of the consequences, all LUCHMAN'S outlay would go for nothing and his reputation be irreparably damaged. In due time however, when everybody is satisfied that everybody else will find it to his own interest to observe the compact, the real business begins. RAMPERSAUD, poor little fellow, is dressed in red, and accompanied by the "parsons" and his friends, chanting marriage ditties, he marches to visit his bride's parents. A feast is prepared at the house of the charmer on the occasion, and finally, after much feasting and readings of portions of the Holy Books by the "parsons," the matter is fixed and RAMPERSAUD lays aside his gorgeous clothing to sleep no more in it, while his elders feast, and returns to his daily avocations in the scant but sufficient clothing use has accustomed him to. Theoretically much of this is incorrect on LUCHMAN'S part. The girl's parents ought to pay for all the feast given at their house, they ought to receive no consideration for their daughter, and in many other little details the ideal and actual vary in

these affairs. What I tell is the actual and typical. For one night the betrothed remain together, after which they part; the lad returning to his own home until he be grown up, when after another feast he claims his wife. RAMPERSAUD during the interval has got on fairly well, he has been put into the weeder's gang first and then into the shovel gang, he has become a very fair cricketer, and plays mostly on Sundays when the patch of rice or herd of cattle do not claim his attention. He is still thrifty and counts every bitt many times before he spends it. But he must spend something and it is seldom with all his haggling that he scores off John Chinaman. He knows little of holidays and wants none, easy work at good prices is much more to his taste. At twenty RAMPERSAUD is a stronger and better developed man than his father. He will eat meat, flesh meat, he will take a schnap if any one offers it, and, his forbears would be startled to see his upright jaunty bearing and hear his cheery 'marnin sir,' as he meets the white man. He still *can* cringe when the occasion demands it but it does not sit well upon him. Instead of whining he has now caught the habit of growling, which is a wonderfully flattering imitation of the Englishman's growl. The work is hard, and he is not afraid of saying so, but he does it and does it well. The pay is small and he tells the overseer he cannot work for it; that the buckra being his "father," "mother," "protector," and all in all, cannot think of asking him to accept it, but the many titled buckra laughingly does so and RAMPERSAUD sets to and earns enough to lay by thirty per cent of his wages towards another cow. At thirty five RAMPERSAUD has boys and girls of his own. LUCHMAN and SOFEE have gone to 'their country' where

we shall all go. Great feasting, the wailings of professional wailers, and a sumptuous bier borne by many willing hands amid a street-long procession marked the occasion of the funeral of each. RAMPERSAUD still occupies a considerable share of the corner of the range with his family, and though not rich he is comfortable. Others have been to India and come back shorn and disillusioned. He resolves wisely that he is at home here, and makes the most and best of it accordingly. His boys—not the girls—go to school and he indulges in great ambitions for them. They bring home and impart impressions and thoughts which sap the life out of all his old beliefs, and he sees them becoming Anglicised and developed into manly stalwart fellows as much beyond himself as he was beyond his father. His father, LUCHMAN, never spoke of SOFEE except by such a title as “RAMPERSAUD’S mother,” or “my boy’s mother,” but RAMPERSAUD has been laughed and chaffed out of this by his boys. When his own little girl died his heart was too sore to have the feast and wailings, and although he was and is not a Christian, it gave him a world of satisfaction and comfort when the buckra clergyman allowed him to lay her quietly to rest under the tree in the churchyard corner. He has got more and more out of touch with his country “parsons” and their lies and deceits, but he does not know quite what to make of it all. He is the link between two orders, the old and effete and the new, the vigorous, manly, free, and self-reliant. The day of life like the natural day wanes at last, and RAMPERSAUD, surrounded by his boys and girls, listening as he hears his sons’ wives hushing their little mites, whose tiny voices are music to his old ears, feels himself going

down to the rest and quiet he thinks will be welcome to his old heart and mind. Many thoughts chase each other through his brain, when the rest are at work and he has the mites brought in to cheer him with their half English and half Hindee prattle. He tries to dandle them but soon gets tired, and then, as he rests, he is a boy again listening to SOFEE and LUCHMAN. Scraps of their talk of Benares and Calcutta recur to him, and then his wandering faculties return and he remembers the doleful tales returned immigrants have told him, and gets very confused. Under all this runs the current of hope; that unquestionably divine hope of life and beauty, of cities and gardens and rivers of water unpolluted by the corruptions of earth. Babbling more or less of these things he quietly passes away. He too now has gone to his "country." He has done much; how much I am too feeble to say; but what problems his life's history suggests! What conflicting evidences he affords us of hereditary influences, indeed of the doctrine of heredity itself, and of the potency of environment! As I talk to him and watch him I feel that he offers a wonderful opportunity to the truth-seeking philosopher to impress upon himself his own littleness and uncertainty. For a while in everything, environment has it; instance after instance confirms one's pet theories, and then in the most unexpected places and at most critical times up comes heredity and brushes aside what then seems the feeble effect of surroundings, and you or I, poor little philosophical onlookers, retire staggered and puzzled to ponder again over these many life problems we cannot solve and are equally unable to leave unsolved.

Then crops up the question, what shall be the future of this section of our community? Will the Creole East


Indian intermarry with other races, will his wonderful powers of adaptation fit him to stand and walk, to lead and govern, without the white man behind him? We know his capacity for being governed; can he and will his descendants have power to govern? Are there marks of limitations observable in his progress? In this fight between Heredity and Environment will either conquer or will the end be compromise? If so, in what form?

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## *Note on the Arrangement of Sugar Cane Experiments.*

*By J. B. Harrison, M.A., &c., &c.*

N the paper which I recently read before the Royal Agricultural and Commercial Society, while speaking of the experiments conducted by Mr. SCARD on behalf of the Colonial Company, I alluded to the fact that agricultural experiments on sugar estates are necessarily carried out on plots of considerable area, probably of, at least, half an acre in size. The difficulty, or rather the almost impossibility, of securing fields of areas of 12 acres and over, upon which the soil is of such uniformity of composition and texture that each half acre upon it is of equal fertility with every other, militates greatly against the accuracy and consequent success of such experiments. In some cases the differences on adjacent half acres of land are so great as not only apparently to neutralise the effects of manures, but even to invert them, and we may get such improbable results as a diminution in yield of sugar per acre by the application of 2 cwt. of sulphate of ammonia.

While broad questions with regard to the composition of sugar cane manures and to the relative values of different varieties of canes can be settled by the experiments which are being carried on at the Botanic Gardens, it is very evident that the final decisions on these points must be arrived at on the sugar estates. The problem, therefore, presents itself as to how we may most readily obtain correct conclusions.

Difference due to varying seasons and rainfall can, of

course, be eliminated by carrying the experiments over some years, but where the trials are only carried out on single plots for each manure or for each variety of cane, soil differences are accentuated and not eliminated if the same plots are used, as they must be when canes are ratooned, year after year.

We cannot eliminate the soil differences, but we can arrange our experiments in such a manner as to minimise the effects of the differences upon the conclusions which we draw from the results.

I have spent some time in working out a fairly simple arrangement of experiments by the use of which the planters of the colony may, perhaps, be assisted in their choice of manures and selection of varieties of canes, and which appears to me to offer as complete control over soil differences as can be obtained in a necessarily restricted series of field experiments.

In order to have any control on the accuracy of the results, the experiments must be conducted in duplicate at least, and each series of plots should have two left unmanured, or where varieties are being experimented with, two plots planted with Bourbon canes; and these control plots must be so placed that the returns upon them may fairly represent the mean fertility of the land under experiment.

For experiments on a sugar estate where, as a general rule, it will not be feasible to weigh the produce from the separate plots but only to measure the juice obtained, half an acre will, probably, be found the most convenient size for each plot.

Dam beds should not be included in any system of experiments, and where possible the portion of a field

devoted to experimental purposes should be surrounded by canes cultivated in the usual manner.

Plan No. 1, shows a scheme of experiments using twenty-four half acre plots with the more promising of the new seedling varieties. In it the Bourbon variety occupies two plots, in each series of trials; and each new variety occupies two plots at some distance from each other in the field. The results from such a series carried over one crop of plant canes and three of ratoons should give to the estate fairly reliable data as to the advisability or not of planting parts of it with one or other variety on a more extended scale.

Plan No. 2, gives the details of a group of experiments with manures arranged in a similar manner. On our soils, in my opinion, the principal points to be decided upon on an estate now are :—

1stly. Can nitrate of soda be used with financial advantage in the place of sulphate of ammonia?

2ndly. Are moderate applications, say of 150 lbs. per acre, of sulphate of ammonia pecuniarily as advantageous as higher ones of, say, 225 lbs?

3rdly. Ought applications of nitrogenous manures to be supplemented with phosphatic ones?

4thly. If so, is it most advantageous to apply the phosphates in the form of superphosphate with the nitrogenous manures each year, or to apply a heavy dressing of superphosphate to the plant canes only, or to use heavy dressings of slag phosphates to the plant canes with later cross dressings of nitrogenous manures?

The group proposed will give answers more or less decisive to these questions if due care is given to the choice of the field for experiment and to the details of planting, etc,

## No. 1.

## A

|        |         |
|--------|---------|
| No. 1  | No. 145 |
| No. 2  | No. 115 |
| No. 3  | No. 130 |
| No. 4  | No. 116 |
| No. 5  | Bourbon |
| No. 6  | No. 117 |
| No. 7  | No. 95  |
| No. 8  | No. 74  |
| No. 9  | No. 78  |
| No. 10 | No. 102 |
| No. 11 | Bourbon |
| No. 12 | No. 109 |

## B

|        |         |
|--------|---------|
| No. 1  | No. 95  |
| No. 2  | Bourbon |
| No. 3  | No. 74  |
| No. 4  | No. 78  |
| No. 5  | No. 102 |
| No. 6  | No. 109 |
| No. 7  | No. 145 |
| No. 8  | Bourbon |
| No. 9  | No. 115 |
| No. 10 | No. 130 |
| No. 11 | No. 116 |
| No. 12 | No. 147 |

## No. 2.

## A

|        |  |
|--------|--|
| No. 1  | Superphosphate 200 lbs.<br>Sulphate of Ammonia,<br>225 lbs.                            |
| No. 2  | Superphosphate 200 lbs.<br>Nitrate of Soda 300 „                                       |
| No. 3  | Basic Slag 400 lbs. at<br>planting. Sulphate of<br>Ammonia, 150 lbs. each<br>year.     |
| No. 4  | Superphosphate 400 lbs.<br>at planting. Sulphate<br>of Ammonia, 150 lbs.<br>each year. |
| No. 5  | Not Manured.   |
| No. 6  | Basic Slag 800 lbs. at<br>planting. Sulphate of<br>Ammonia, 150 lbs. each<br>year.     |
| No. 7  | Sulphate of Ammonia,<br>150 lbs. per acre.   |
| No. 8  | Nitrate of Soda 200 lbs.<br>per acre.  |
| No. 9  | Superphosphate 200 lbs.<br>Sulphate of Ammonia,<br>150 lbs.                            |
| No. 10 | Superphosphate 200 lbs.<br>Nitrate of Soda 200 „                                       |
| No. 11 | Not Manured.   |
| No. 12 | Sulphate of Ammonia,<br>225 lbs.   |

## B

|        |  |
|--------|--|
| No. 1  | Sulphate of Ammonia,<br>150 lbs. per acre.   |
| No. 2  | Not Manured.   |
| No. 3  | Nitrate of Soda, 200 lbs.<br>per acre.   |
| No. 4  | Superphosphate 200 lbs.<br>Sulphate of Ammonia,<br>150 lbs.                            |
| No. 5  | Superphosphate 200 lbs.<br>Nitrate of Soda 200 „                                       |
| No. 6  | Sulphate of Ammonia,<br>225 lbs.   |
| No. 7  | Superphosphate 200 lbs.<br>Sulphate of Ammonia,<br>226 lbs.                            |
| No. 8  | Not Manured.   |
| No. 9  | Superphosphate 200 lbs.<br>Nitrate of Soda 300 „                                       |
| No. 10 | Basic Slag 400 lbs. at<br>planting. Sulphate of<br>Ammonia 150 lbs. each<br>year.      |
| No. 11 | Superphosphate 400 lbs.<br>at planting. Sulphate<br>of Ammonia, 150 lbs.<br>each year. |
| No. 12 | Basic Slag 800 lbs. at<br>planting. Sulphate of<br>Ammonia, 150 lbs. each<br>year.     |

The following are the details of the manurings :—

| PLOTS.                     | MANURES USED.   |
|----------------------------|---|
| Nos. 5 and 11 A, 2 and 8 B | ... Not manured.  |
| Nos. 7 A and 1 B           | ... 150 lbs. per acre per annum of sulphate of ammonia.   |
| Nos. 8 A and 3 B           | ... 200 lbs. per acre per annum of nitrate of soda.   |
| Nos. 9 A and 4 B           | ... Superphosphate of lime (36 o/o) 200 lbs., sulphate of ammonia 150 lbs. per acre per annum.  |
| Nos. 10 A and 5 B          | ... Superphosphate of lime (36 o/o) 200 lbs., nitrate of soda 200 lbs. per acre per annum.  |
| Nos. 12 A and 6 B          | ... 225 lbs. per acre per annum of sulphate of ammonia.   |
| Nos. 1 A and 7 B           | ... Superphosphate of lime (36 o/o) 200 lbs., sulphate of ammonia 225 lbs. per acre per annum.  |
| Nos. 2 A and 9 B           | ... Superphosphate of lime (36 o/o) 200 lbs., nitrate of soda 300 lbs. per acre per annum.  |
| Nos. 3 A and 10 B          | ... 400 lbs. of slag phosphate per acre applied to plant canes, and cross dressed with 50 lbs. sulphate of ammonia per acre per annum.              |
| Nos. 4 A and 11 B          | ... 400 lbs. of superphosphate (36 o/o) per acre applied to plant canes, and cross dressed with 150 lbs. of sulphate of ammonia per acre per annum. |
| Nos. 6 A and 12 B          | ... 800 lbs. of slag phosphate per acre applied to plant canes, and cross dressed with 150 lbs of sulphate of ammonia per acre per annum.           |

I have made no reference to potash salts in this scheme because, as a rule, their application to our heavy clay

soils will certainly not be accompanied with benefit, and where lighter soils occur, an opinion may now be formed by the use of DYER'S method of soil analysis which will serve as a fairly reliable guide for the advisability of their use.

By using groups of experiments arranged on similar lines to the one now recommended, planters can, if they desire to do so, satisfy themselves as to the relative merits on their soils of the various sugar cane manures offered to them by manufacturers and of the advisability of the use of gypsum, sulphate of iron, mineral phosphates and other suggested manurial matters, and if applied to, I shall always be pleased to draw out for planters arrangements of trial plots which, in my opinion, will tend to elucidate these or similar agricultural problems.

It is important for the practical planter to bear in mind the well authenticated fact that the yields of plants cultivated on the experimental scale almost invariably are much higher than the average of those obtained over large areas, and that, in consequence, the differences in yields either of varieties of canes, or due to the actions of manures, will be more accentuated on his experimental field than he can hope to obtain on the fields of his estate.

## ***Report of Meetings of the Society.***

***Meeting held January 14th.***—Prof. J. B. Harrison, M.A., &c., President, in the Chair.

Members present 25.

Elections.—*Member* : Dr. J. M. Rohlehr.

*Associates* : Messrs. J. H. Straker, Wm.

Ritchie and Arthur Cox.

The President then addressed the meeting as follows:—

Only a week ago I was felicitating myself on the thought that you would not want a speech from me as President. I found, however, that Mr. Rodway had advertised one. Consequently, I have found some difficulty in hitting upon a subject. I am not a planter, and therefore I can not speak about the hardships accruing from the Bounties with any great authority. I am not a merchant, and can not touch on the many aspects of commercial matters. I am not a lawyer, and therefore am not able to dilate eloquently on any subject whatever. I originally intended to give a short account of the recent experiments with respect to the Sugar Cane made at the Botanic Gardens and elsewhere, but I have decided to wait until the Agricultural Report (the work of Mr. Jenman and myself) has been published. When this has been published, probably in March next, I will prepare a short and condensed paper on the subject. Of course, in a report of that nature, yards and yards of figures are necessary, so that other scientists may check it and glean information therefrom ; but for the immediate purpose of the planter all these figures are not necessary. I will prepare simply a short



paper and put the whole thing in a popular form. This I purpose doing instead of now inflicting an inaugural address upon you. Another subject concerning which I might have spoken to you, is the general geology of the West Indian Archipelago, a subject to which I have given some attention. Later in the year I purpose to prepare a paper on that subject also. With regard to other papers, I propose to ask Mr Quelch to deliver an address dealing with some zoological subject closely connected with this colony, and to request Mr. Jenman to write for you a paper dealing with the influence of botanical research upon agricultural progress. These are some of the useful papers we may take up during this year. One of the most important points which will come before you will be the advent of the Sugar Commissioners. It is not necessary for this Society to take steps to arrange for the evidence to be offered to the Commissioners, as this has already been arranged by a large and representative committee of planters, engineers, &c., appointed by the Planters' Association, which committee has already begun its labours. But it appears to me that it will be desirable for the Society to take note of the visit of the Commissioners, by arranging for a conversazione or an exhibition of articles in connection with the history of the colony and its products, to be given in honour of their visit. You should mark your sense of the importance of the visit in some way or other, and, doubtless, what I have just proposed will be of some interest to the Commissioners as well. The Commissioners as you know, are being accompanied by Dr. Morris, a gentleman who is pre-eminently able to lecture on minor tropical products, I believe that

such a lecture will be highly instructive to you, and I consider that you ought to endeavour to persuade Mr. Morris to give you a lecture on tropical products other than sugar. From what I know of the agriculture and manufacture of the staple product here and elsewhere, I am perfectly confident that the Commissioners will find on the great majority of estates in this colony that agriculture is being carried on in a scientific and up to date manner as applied to heavy clay soils; and that your sugar extraction, as judged by the percentage of the sucrose recovered, is fully equal to modern results and compares favourably even with the Beet producing countries when allowance is made for the differences in structure and compositions of the raw materials. British Guiana planters have even availed themselves of the services of German chemical experts. Of course there are smaller estates in the colony not so well equipped as are the larger ones, but the Commissioners will be sure to arrive at the conclusion that this is due, not in any way to apathy but to a lack of cash and credit which has been caused directly by the low and unremunerative range of prices produced by the Continental Bounty system. Among the principal points to which the Agricultural Committee must direct their attention are the causes of the prevalence of certain obscure plant diseases. The most reliable information regarding these comes from scientific experts in Java, but, unfortunately for us in this colony, their work appears to be done chiefly with the White and Purple transparent varieties which are immune to some of the diseases affecting the Bourbon, while more subject to others such as the leaf-rust fungus. Hence we find the Java authorities inclined to consider *Trichosphaeria sacchari*

as purely saprophytic, while with us under certain conditions it assumes a parasitic form. The prevalence of disease among the stock of the cattle farms in the colony is also a matter which calls for attention by the Agricultural Committee. Unfortunately the Government Veterinary Surgeon is not a member of that Committee. As to minor agricultural industries, the Honourable Mr. Weber and Mr. Conrad have always evinced much interest in them. The Committee of Correspondence last year attempted to increase interest in these matters by means of the annual Horticultural Show. The success of the last Exhibition was due largely to encouraging the artisans and labourers of the colony to send samples of their handiwork and industry to the Horticultural Show. The result of the Show evinced most clearly that this colony could produce samples of articles equal to any produced elsewhere; but the question is whether we can produce them in quantity at remunerative prices. I hope, and I am sure that you will all join in the hope, that future Horticultural Shows will be still more successful, especially in regard to the exhibits of artisans and labourers. The Committee of Correspondence intended, if funds would allow, to largely extend the prize-list in connection with that section. They consider that they should do everything to encourage the artisans and labourers in taking up these minor products and imbibing a taste for agricultural practice. It appears to me that the chances of successfully growing rice, cacao, cotton, &c., are very small on the coast lands, and that if we are compelled to grow products other than sugar, we shall have to resort to lands far in the interior where we find intrusive dykes of pyroxene diorite,

dolerite, or what Professor Azruni terms gabbro. Where this class of rock occurs, we invariably get ochre coloured loams, frequently of a high fertility. I have seen soils here of this kind that favourably compare with the cacao soils of Grenada and other West Indian islands. In connection with this matter, the Government are taking steps to examine into the composition of the soils of certain parts of the colony in their own occupation, to act as a guidance as to the desirability of future further examinations. Unfortunately, when we come to consider such products as cacao, coffee, &c., very little can be found recorded in English literature dealing with the agricultural requirements of the plants. In the report of the Botanic Gardens to be shortly published, Mr. Jenman and myself have made an attempt to supply some of this with regard to cacao, and we hope to supply similar information later with regard to other products. Our Venezuelan neighbours are in advance of us in these matters, possessing in Caracas, an Agricultural College with a Professor of Agricultural Science. They also have established agricultural colonies for men of limited means in selected districts in the interior which I believe have been most successful in their results. I now suggest that the desirability of the establishment of similar settlement should be represented to the Royal Commissioners by some of us who are interested in minor agricultural products. An interesting point for discussion has been indicated to me by Mr. T. S. Hargreaves, the Secretary of the Institute of Mines and Forests, on the effect of the gold industry upon the labour supply for agricultural purposes. I believe Mr. Hargreaves is prepared to supply figures to show that the gold industry has not proved inimical,

on the whole, to the agricultural prosperity of the Colony ; and I think that you will welcome a paper from him on that subject. Besides the points I have briefly referred to, there are many others, one of which is the development of the timber trade, in which our late President takes so much interest. This is a subject which must engage the attention of the Society during the ensuing year. I trust that by the Society giving all the attention in its power to matters connected with the agricultural development of the colony, it will more fully deserve its title of Royal Agricultural Society in the future, than in the opinion of a certain former President of the Society, it has done in the past. This will not interfere with its work as a Literary Society in which, by its liberal upkeep of the Reading Rooms it acts as a benefit to very many of the inhabitants of the Colony. Personally I trust that during my year of office, I may prove useful to the best interests of the Society to whose recommendations I am so greatly indebted for the present state of efficiency of my Department.

On the motion of the Vice-President a hearty vote of thanks was accorded."

In connection with the proposed shipment of Furniture Woods, the Secretary reported that Mr. R. W. Hubbard wrote on the 15th ulto., stating his inability to procure the Ducaliballi timber and therefore the impossibility of his executing the Society's order. He, Mr. Daly, wrote at once to Mr. Seon, who had promised to supply the woods. He had received a letter from Mr. A. E. Messer, written at Wimbledon, suggesting that a market might be formed in London for Mora as it would probably be as useful for wood paving as the Australian Jarra. He

also read the annexed letter from Messrs. Foy, Morgan & Co :—

London, 29th December, 1896.

Thomas Daly, Esq.,

Hon. Sec. Royal Agricultural and Commercial Society.

Dear Sir,—In reply to your favour of the 25th ult., we are pleased to note that as a result of our conversation with the Hon Cavendish Boyle, C.M.G., you are making arrangements to ship 30-40 logs Ducaliballi, Purple Heart, &c., to our care in this market, and we think it will be best for you to do the marine insurance upon same.

We act as Agents for the sale of wood-goods on Commission and shall be pleased to take charge of the above named woods and sell same for your account, rendering you a/c sales and cheque for net proceeds in due course. If the logs you send prove to be suitable for our buyers, they would probably give us orders for further supplies, but we strongly advise you to ship only the largest and *best* logs to this market until a trade is established. We will report on the various logs when landed here.

Yours very truly,

FOY, MORGAN & CO.

Mr. Luke M. Hill said that if Mora was sent for pavements the best form would be in three inch planks, nine inches wide.

The Hon. Mr. Boyle said that the Australian woods were received in blocks ready to lay down.

In reply to a question of Mr. Davis, Mr. Hill said that in making out an estimate for wood paving in Georgetown, he had found that it would be cheaper to import English beech than to obtain Mora from the woodcutters.

Mr. Quelch spoke of the desirability of sending samples of crabwood, on account of its resemblance to mahogany.

The Secretary reported the following elections of Office-Bearers for 1897 :—

*Agricultural Committee*—Chairman : Hon. B. Howell Jones ; Vice-Chairman : Prof. J. B. Harrison ; Secretary : S. M. Bellairs.

*Commercial Committee*—Chairman : Jacob Conrad ; Vice-Chairman : J. Y. Baldwin ; Secretary : Wm. Cunningham.

*Book Committee*—Chairman : S. M. Bellairs ; Vice-Chairman : Jas. Gillespie.

The Treasurer laid over his annual statement of the finances of the Society showing a balance in hand of \$1,645 73. He spoke of the necessity for economy as the Society was simply living from hand to mouth. It was necessary to have a balance in hand for they were continually incurring expense for repairs to the buildings, and soon these would again want painting, which would require more than the present surplus.

The Hon. Mr. Davis thought the Treasurer took too depressing a view of their financial condition, and Mr. Hargreaves spoke of the want of a proper room for the Curator of the Museum.

The Statement was referred to the next meeting, to be audited by two Directors in accordance with the By-Laws.

The Secretary read the following report from the Agricultural Committee :—

Georgetown, December 30th, 1896.

To the President and Members of the

R. A. & C. Society,

Gentlemen,—On behalf of the Agricultural Committee of the Society, I have the honour to report that the letter of Mr. Norman Forster on Jute Cultivation has been considered by the Committee, who directed me to report that they will be prepared to do all in their power to assist Mr. Forster in his project for introducing the culture of Jute into the colony.

I have also the honour to lay over copy of a letter from Professor Harrison, covering an interesting report on the results of manuring in connection with cane fungus, which the Committee thought of so much

importance that it has been printed for distribution to the members interested in agriculture.

I have, &c.,

S. BELLAIRS,  
Secretary, Agricultural Committee

Government Laboratory,

Georgetown, Demerara, December 21st, 1896.

Dear Mr. Jones,—Mr. Gilzean arranged with me before he left, to carry out the experiments with Manures on *Ruimveld*, so as to ascertain whether the prevalence or the intensity of Fungus disease is in any way influenced by Manures. This has been done, and I enclose for you as Chairman of the Agricultural Committee the table of results.

I superintended the weighings of the canes and the separation of the diseased canes. I considered as diseased all canes showing any external sign of rind fungus. I ascertained the percentage of the canes diseased by numbers and also by weight. You will notice that all the fields were affected by the disease, and that its intensity appeared to be largely in proportion to the nitrogen in the Manures applied.

| 2 cwts. of Demerara Mixture, |                          | 27 lbs. Nitrogen, |     |
|------------------------------|--------------------------|-------------------|-----|
| 20                           | „ Sheep Manure (average) | 34                | „ „ |
| 3½                           | „ Chinchas Guano         | 35                | „ „ |
| 3½                           | „ Ohlendorf's Guano      | 30                | „ „ |
| 4                            | „ Nitrate of Soda        | 72                | „ „ |
| 4                            | „ Sulphate of Ammonia    | 90                | „ „ |

Yours faithfully,

J. B. HARRISON,



## RESULTS OF THE MANURIAL EXPERIMENTS AT RUMVELD, 1893.

| MANURES APPLIED.  | Weight of Manure per Acre. | Tons of Canes per Acre. | Percentage of diseased Canes, |            | Per-centage of juice. | Specific Grv'ty. | Gallons of juice per Acre. | Lbs. per Gallon. |         |            | Quotients of |            | Lbs. per Tons of 1st and 2nd Sugar 85 o/o |
|---|----------------------------|-------------------------|-------------------------------|------------|-----------------------|------------------|----------------------------|------------------|---------|------------|--------------|------------|---|
|   |                            |                         | by number.                    | by weight. |                       |                  |                            | Sucrose.         | Gl'ose. | Non Sugar. | Purity.      | Non Sugar. |   |
|   |                            |                         |                               |            |                       |                  |                            |                  |         |            |              |            |   |
| Canes as reaped.  |                            |                         |                               |            |                       |                  |                            |                  |         |            |              |            |   |
| Sheep Manure .. 20 cwt.   | 13.9                       | 13.9                    | 28                            | 27.2       | 58.5                  | 1.079            | 1.693                      | 1.755            | .077    | .217       | 85.6         | 8.7        | 2,971 1.13                                |
| Raw Chinchas Guano 3.5 "  | 14.3                       | 14.3                    | 33                            | 33.5       | 67.1                  | 1.076            | 1.997                      | 1.539            | .250    | .193       | 78           | 9.8        | 3,012 1.14                                |
| Nitrate of Soda .. 4 "  | 15.1                       | 15.1                    | 41                            | 41.6       | 66.7                  | 1.063            | 2.118                      | 1.526            | .065    | .156       | 86.3         | 8.8        | 3,232 1.23                                |
| Sulphate of Ammonia .. 4 "  | 19.5                       | 19.5                    | 51                            | 53.1       | 63.3                  | 1.064            | 2.627                      | 1.908            | .068    | .264       | 78.9         | 15.9       | 3,408 1.29                                |
| Ohlendorff's Dissolved Guano .. 3.5 "   | 16.8                       | 16.8                    | 44                            | 41.1       | 63.7                  | 1.079            | 2.273                      | 1.572            | .121    | .304       | 76.6         | 15.2       | 3,573 1.36                                |
| Demerara Mixture .. 2 "   | 17.1                       | 17.1                    | 53                            | 28.6       | 64.7                  | 1.077            | 2.361                      | 1.706            | .138    | .183       | 85.4         | 7.6        | 4,028 1.53                                |
| If the Canes had not been attacked by Fungus Disease the results would have been :- |                            |                         |                               |            |                       |                  |                            |                  |         |            |              |            |   |
| Sheep Manure .. 20 cwt.   | 13.9                       | 13.9                    | ...                           | ...        | 61.5                  | 1.064            | 1.771                      | 1.866            | .071    | .215       | 86.9         | 9.8        | 3,358 1.27                                |
| Raw Chinchas Guano 3.5 "  | 14.3                       | 14.3                    | ...                           | ...        | 63.9                  | 1.080            | 2.002                      | 1.693            | .260    | .134       | 81.4         | 6.9        | 3,390 1.29                                |
| Nitrate of Soda .. 4 "  | 15.1                       | 15.1                    | ...                           | ...        | 63.8                  | 1.078            | 2.164                      | 1.811            | .045    | .167       | 89.4         | 8.2        | 3,320 1.48                                |
| Ohlendorff's Dissolved Guano 3.5 "  | 16.8                       | 16.8                    | ...                           | ...        | 62.9                  | 1.083            | 2.191                      | 1.863            | .085    | .212       | 86.3         | 9.8        | 4,083 1.55                                |
| Demerara Mixture .. 2 "   | 17.1                       | 17.1                    | ...                           | ...        | 67.6                  | 1.081            | 2.402                      | 1.814            | .156    | .131       | 86.2         | 6.3        | 4,337 1.65                                |
| Sulphate of Ammonia .. 4 "  | 19.5                       | 19.5                    | ...                           | ...        | 64.5                  | 1.078            | 2.620                      | 1.699            | .055    | .269       | 83.1         | 15.9       | 4,452 1.69                                |
| Loss of 1st & 2nd Sugars due to Fungus attacks.                                     |                            |                         |                               |            |                       |                  |                            |                  |         |            |              |            |   |
| Per cent of Sugars.   |                            |                         |                               |            |                       |                  |                            |                  |         |            |              |            |   |
| Demerara Mixture ..   | 7.3                        | 12                      |                               |            |                       |                  |                            |                  |         |            |              |            |   |
| Sheep Manure ..   | 11.0                       | 14                      |                               |            |                       |                  |                            |                  |         |            |              |            |   |
| Raw Chinchas Guano, Ohlendorff's Dissolved Guano ..                                 | 11.6                       | 15                      |                               |            |                       |                  |                            |                  |         |            |              |            |   |
| Nitrate of Soda ..  | 12.2                       | 19                      |                               |            |                       |                  |                            |                  |         |            |              |            |   |
| Sulphate of Ammonia ..  | 15.9                       | 25                      |                               |            |                       |                  |                            |                  |         |            |              |            |   |
|   | 25.8                       | 40                      |                               |            |                       |                  |                            |                  |         |            |              |            |   |

J. B. HARRISON,  
Geot. Analyst.

J. B. HARRISON.  
Genl. Analyst.

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**The Royal Agricultural and Commercial Society of British**


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**RECEIPTS.**

|  |       |          |          |             |
|--|-------|----------|----------|-------------|
| To Society's funds, 31st Dec. '95...                 |       |          |          | \$ 1,096 05 |
| „ Subscriptions—                                     |       |          |          |             |
| Lady Members ...                                     | ...\$ | 147 50   |          |             |
| Ordinary „ ...                                       | ...   | 1,730 00 |          |             |
| Country „ ...  | ...   | 442 00   |          |             |
| Associates ...                                       | ...   | 1,183 75 |          |             |
| Arrears ...  | ...   | 4 50     | 3,507 75 |             |
| „ Rents ...  | ...   |          | 2,844 00 |             |
| „ Fines ...  | ...   |          | 3 58     |             |
| „ Catalogues ...                                     | ...   |          | 42 12    |             |
| „ Interest on Hand-in-Hand Scrip<br>to 30th June ... | ...   | 60 00    |          |             |
| „ Profit on Policies ...                             | ...   | 237 36   | 297 36   | 6,694 81    |

|   |        |          |          |                     |
|---|--------|----------|----------|---------------------|
| „ Balance at credit Museum a/c.,<br>31st December, 1895 ... |        | 34 61    |          | \$ 7,790 86         |
| „ Government vote for the year...                           |        | 4,500 00 | 4,534 61 |                     |
| „ Govt. vote for Horticultural<br>Exhibition ...            | 500 00 |          |          |                     |
| „ Mowing competition—Special<br>donations ...               | 15 00  |          |          |                     |
| „ Special donation towards Prize<br>Fund ...                | 10 00  |          |          |                     |
| „ Gate Money ...  | 657 00 |          |          |                     |
| „ Society's contribution ...                                | 53 43  |          |          |                     |
|   |        |          |          | <u>1,235 43</u>     |
|   |        |          |          | <u>\$ 13,560 90</u> |

Imperial Institute—balance at  
credit 31st December, 1895...

\$ 193 04

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# REPORT OF SOCIETY'S MEETINGS.

165

## Guiana—Receipts and Expenditure for the Year 1896.

| EXPENDITURE.   |        |          |              |
|--|--------|----------|--------------|
| Salaries ... ..  |        | \$ 2,664 | 00           |
| Periodicals, Magazines and News-papers ... ..                        | \$ 655 | 74       |              |
| Less sales of old papers ... ..                                      | 37     | 83       | 617 91       |
| New Books added to Library ... ..                                    |        | 537      | 14           |
| Subscriptions to English Societies ... ..                            |        | 20       | 46           |
| Advertising ... ..   |        | 145      | 35           |
| Binding ... ..   |        | 76       | 12           |
| Insurance with Hand-in-Hand ... ..                                   |        | 875      | 00           |
| Postages, Stationery, Petty and Reading Room expenses ... ..         |        | 221      | 54           |
| Premises—Repairs during year ... ..                                  |        | 119      | 96           |
| Furniture—cost of new Furniture and repairs ... ..                   |        | 111      | 06           |
| Catalogue—compiling and printing ... ..                              |        | 364      | 00           |
| Cost of <i>Timehri</i> ... ..  | 566    | 36       |              |
| Less sales by Publisher, \$203 92                                    |        |          |              |
| " " " Stanford 23 28   | 227    | 20       | 339 16       |
| Cost to Society of Horticultural Exhibition ... ..                   | 53     | 43       | 6,145 13     |
| Society's funds as per Bal. Sheet ... ..                             |        |          | 1,645 73     |
|  |        |          | \$ 7,790 86  |
| Paid for maintenance of Museum, per separate statement ... ..        | 4,496  | 17       |              |
| Amount at credit per Bal. Sheet ... ..                               | 38     | 44       | 4,534 61     |
| Paid cost of Horticultural Exhibition, per separate statement ... .. |        |          | 1,235 43     |
|  |        |          | \$ 13,560 90 |
| Paid for a log of Timber ... ..                                      | 3      | 96       |              |
| " " 9 dozen Iron Hoops ... ..  |        | 4        | 32           |
| Amount at Cr. per Bal. Sheet ... ..                                  | 184    | 76       | \$ 193 04    |

The annexed report of the Committee of Correspondence was also read :—

The Museum, Jany. 14, 1897.

R. T. A. Daly, Esq.,

Secy. Royal Agricultural & Commercial Society.

Sir,—I have the honour to state that at a meeting of the Committee of Correspondence held yesterday, Mr. S. M. Bellairs was elected Chairman, and Mr. T. S. Hargreaves, Vice-Chairman for the current year.

I was also requested to forward to you the enclosed letter *re* the Cattle and Horse disease in the E. Coast district, to be laid before the general meeting of the Society, in order that suggestions be made for lessening the evil complained of.

I have the honour to be, &c.,

J. J. QUELCH,

Hon. Secy., Committee of Correspondence.

In reference to Mr. Hassell's letter on the Cattle disease, it was agreed that a copy of the same be forwarded to the Government and that it be also referred to the Agricultural Committee.

In the matter of the President's motion for the adoption of Sections 5 and 6 of the recommendations of the Report on the Horticultural Show, he stated that as they referred to a question of finances he would propose that they be left to the Directors. This having been seconded by the Hon. Mr. Boyle, it was carried unanimously.

In the absence of Capt. A. Duncan, Mr. Luke M. Hill brought forward the matter of the specimen inlaid tables left over from the previous meeting. He moved that the two tables before the meeting be purchased by the Society and forwarded to Messrs. Foy, Morgan & Co., with a request that they would exhibit them in their sample room for a time, and afterwards endeavour to sell them for the benefit of the Society.

This having been seconded by Mr. Conyers, the Rev. Mr. Ritchie spoke in favour of some other specimens of

turned pillars, cornices, mouldings, &c. being prepared to exhibit the capabilities of the Colony's woods.

The motion was carried.

A letter from Mr. R. W. S. Mitchell, Calcutta, was read, and the package of Jute seed therein referred to, laid upon the table. The Secretary stated that by request of the Directors he had written to Mr. Jenman for suggestions as to the disposal of the seed, and that gentleman had kindly replied and offered to put it in packets for distribution.

It was agreed that Mr. Jenman's suggestions be adopted.

The thanks of the Society were accorded to Mr. G. S. Jenman for a portrait of Baron Ferdinand von Mueller ; also for the following donations to the Museum :—

|   |        |                          |
|---|--------|--------------------------|
| Miscellaneous Specimens from                | ...    | ...C. A. Loyd.           |
| 8 Coins                                     | ... .. | ...Dr. A. Cruyt.         |
| Nest of Swift and Moth                      | ... .. | ...M. McLeod.            |
| 7 Natural History Specimens                 | ... .. | .. G. S. Jenman.         |
| 2 Samples Black Sand with analyses          | ... .. | ...Prof. J. B. Harrison. |
| Catlinite and Stone Implements              | ... .. | ...C. W. Anderson.       |
| Mosquito Worms                              | ... .. | ...Dr. C. W. Daniels.    |
| Land Snails and Larva                       | ... .. | ...J. Rodway.            |
| 1 Bird and 5 Butterflies                    | ... .. | ...F. V. McConnell.      |
| Share Certificates, &c., of B.G. Museum Co. | ... .. | ...Dr. J. E. Godfrey.    |
| 1 Scorpion                                  | ... .. | ...W. Veccock.           |
| Abnormal Fowl's Egg                         | ... .. | ...T. S. Hargreaves.     |
| Harpy Eagle                                 | ... .. | ...J. Moir.              |
| Glass and Stones from Powis' Gizzard        | ... .. | ...J. A. Murray.         |
| Locust                                      | ... .. | ...A. Gordon.            |
| Rice grown in Bowl                          | ... .. | ...A. van Schalwyck.     |

The meeting then terminated.

*Meeting held February 11th.*—Prof. J. B. Harrison, M.A., &c., President, in the Chair.

Members present 8.

Elections.—*Members* : Rev. P. A. Farrar, Mr. E. C. Hamley.

*Associates* : Messrs. F. B. Gall, W. H. Davies and David Donnelly.

The Honorary Treasurer laid over the annexed Statement and Balance Sheet for 1896, which, having been audited by the Directors in accordance with the By-Laws, was adopted and ordered to be hung up in the Reading Room.

Mr. Conyers moved, and Mr. L. M. Hill seconded, that the balance at credit be handed over to the Directors, to be used by them in any way that was considered most conducive to the interests and objects of the Society. This was unanimously agreed to.

The Secretary read the following Report from the Agricultural Committee :—

Georgetown, February 10th, 1897.

To the President and Members of the

Royal Agricultural and Commercial Society.

Gentlemen,—On behalf of the Agricultural Committee of the Society I have the honour to report that they have considered Mr. Hassell's letter in reference to the Cattle Disease on the East Coast, and are of opinion that Mr. Hassell should have reported the matter to the Government some months before, in accordance with the Ordinance, when an Inspector, or the Government Veterinary Surgeon, would have been sent to enquire into it.

I have also to report in connection with Mr. Scard's paper on Cane Farming that the Committee have made enquiries as to the number of plantations the proprietors of which would buy canes in accordance with a scale to be fixed by the Society, and have drawn up a list which they propose to publish.

I have, &c.,

S. M. BELLAIRS,

Secretary, Agricultural Committee.

(*Copy of Circular*).

Royal Agricultural and Commercial Society of British Guiana.

Georgetown, 30th December, 1896.

Dear Sir,—By direction of the Agricultural Committee of the

Society, I have the honour to inform you that they have under their consideration the possibility of introducing a system of buying Canes by Sugar Estates, similar to that in use in Trinidad. In connection therewith, I shall be glad to know whether the plantations in which you are interested would be prepared to buy Canes in any quantity that might be brought, at a price to be regulated according to a sliding scale, with a fixed minimum, that might be prepared from time to time by the Society.

I am, &c.,

S. BELLAIRS,

Hon. Sec., Agricultural Committee.

The following Government communication was also read :—

Government Secretary's Office,

Georgetown, Demerara,

22nd January, 1897.

Sir,—I have the honour to acknowledge the receipt of your letter of the 18th instant, enclosing a copy of a letter from Mr. G. J. Hassell, referring to certain diseases prevalent among horses and cattle on a part of the East Coast between Mahaica and Blairmont, and I am desired by the Governor to inform you that the matter will receive attention.

I have, &c.,

CHARLES T. COX.

The Hon. Secretary,

Royal Agricultural and Commercial Society.

The Secretary also read a letter from Mr. G. S. Jenman stating that the Jute Seed planted in the Nursery at the Botanic Gardens had failed to germinate, and that therefore it was useless to distribute it.

The Secretary was directed to inform Mr. Mitchell of the fact.

A letter from Mr. Seon was also read. In reference to the timbers ordered by the Society he reported that some of the logs were ready but could not be floated down the river on account of want of water.

A letter from the Secretary of the Philadelphia Museums

referring to representatives being sent from the colony was referred to the Committee of Correspondence.

The thanks of the Society were accorded to the President for an incomplete set of the early numbers of the Sugar Cane, which the Librarian said it would be desirable to complete if possible.

The President also spoke of the desirability of completing the library set of this journal.

The thanks of the Society were also accorded for the following donations to the Museum :—

|   |                              |     |                    |                             |
|---|------------------------------|-----|--------------------|-----------------------------|
| 4 Birds...                                  | ...                          | ... | Pln. Ogle          | ...from Mr. H. L. Humphrys. |
| 1 Centipede                                 | ...                          | ... | ...                | „ „ J. Roding.              |
| 1 „   | ...                          | ... | ...                | „ „ H. S. Williams.         |
| 1 Stone pestle...                           | ...                          | ... | Conawarook.        | „ „ J. Wilson.              |
| 1 Moth ...                                  | ...                          | ... | ...                | „ „ A. Gordon.              |
| 1 Tarantala                                 | ...                          | ... | ...                | „ Miss Bookman.             |
| Crowa fibre                                 | ...                          | ... | Warramuri...       | „ Mr. J. Griffith.          |
| 1 Brain-stone coral                         | ...                          | ... | Grenada            | „ „ J. Soloman.             |
| 1 Queyu & suspending ham-<br>mock for child | } Barima ... „ Mrs. Bunbury. |     |                    |                             |
| 1 Crapaud snake                             | ...                          | ... | B. Gardens         | „ „ Mr. G. S. Jenman.       |
| 1 Humming bird                              | ...                          | ... | Grenada            | „ „ C. A. Lloyd.            |
| Set of larvæ of cocoa-nut beetle            | ...                          | ... | ...                | „ „ C. A. Young.            |
| Eggs & 3 minerals...                        | ...                          | ... | Connetable's I'ds. | „ „ Capt. McIntosh.         |
| 2 Beetles (rare)                            | ...                          | ... | Barima             | „ „ Mr. W. Greig.           |
| Set of insects                              | ...                          | ... | Barima             | „ „ A. A. Watson.           |

Mr. Quelch exhibited several interesting additions to the Museum collection.

The meeting then terminated.

*Meeting held March 11th.*—Prof. J. B. Harrison, M.A., etc., President, in the Chair.

Members present 10.

Elections—*Member* : Dr. W. de W. Wishart.

*Associate* : Mr. C. C. T. Blyth.



The following Report of the Agricultural Committee was read and taken for notification :—

Georgetown, March 10th, 1897.

To the President and Members of the  
Royal Agricultural and Commercial Society.

Gentlemen,—In accordance with the Government Regulations, under which the Agricultural Committee of the Society are permitted to have free samples of articles of general interest to the Colony, I have the honour to lay over a report on so-called "Faulty" Rum, by the Government Chemist, which the Committee consider to be of great importance.

I have, &c.,

S. BELLAIRS,

Hon. Secretary, Agricultural Committee.

REPORT ON "FAULTY" RUM.

Not unfrequently during recent years complaints have been made by purchasers of Demerara rum in England that the rum was "faulty," and in many cases considerable reductions have been claimed in consequence from the market price, and thus, to a considerable extent, the trade of the colony in rum has been crippled; the lower prices obtained when the rum has been classed as "faulty" not being remunerative.

Rums have been and are classed as "faulty" when on admixture with water in such proportions as to reduce the strength to 25 o/o under proof, which in the case of our rums means approximately their dilution with an equal bulk of water, the diluted spirits, either at once or after standing for some hours, become cloudy, either depositing on longer standing a more or less copious precipitate or showing the presence, in greater or less abundance, of floating flocculencies. This so called test appears to be made at times with cold water, at times with boiling water, but in both cases the rum is left to stand for several hours before a final decision as to its quality is arrived at.

Very many samples of so called "faulty" rum have been, from time to time, sent back to this colony, and have here been re-tested with ordinary rain water or with distilled water. As a rule almost all of these samples have remained perfectly clear, and the reason for their having been classed as "faulty" has appeared to be a mystery.

On a few occasions rums have been found to become cloudy upon dilution with pure water, and the causes of this have been proved in some cases to be the presence of a caramel in the colouring matter easily

soluble in alcohol of a strength of 40 o/o over proof, but insoluble or with difficulty soluble in alcohol of 25 o/o under proof, whilst in other cases the cloudiness has been traced to empyreumatic products, derived from gas liquor, present in the sulphate of ammonia which had been added to the wash to accelerate the fermentation.

Both these causes are easily overcome; in the first case by care in burning the colour, in the second by avoiding the use of sulphate of ammonia prepared from gas liquor, and which may contain empyreumatic products. It is advisable that the sulphate of ammonia used for the purpose of accelerating fermentation should always be "bone" sulphate of ammonia prepared from bones and not the usual quality obtained from gas liquor or from the by-products of coke ovens.

Under these circumstances the Agricultural Committee of the Royal Agricultural and Commercial Society requested me to enquire into this matter, and this, assisted by the experience and advice of Mr. Scard, I have done.

At the commencement of the enquiry it was found that the water supply of Liverpool, from which port the complaints have almost all been derived, is obtained from two sources, one being upland surface water, the other water pumped from deep wells sunk in the new red sandstone. Water derived from deep wells in the new red sandstone not unfrequently contains in solution calcium sulphate and salts of magnesium, and it appeared to me that the cloudiness complained about might be due to the presence of these salts in the water used for testing and not to defects in the rum.

To examine into the possibility of this, weak solutions of sulphate of calcium in water were prepared and used for the purpose of diluting pure alcohol of 45 o/o over proof. It was found that when the alcohol was diluted to the strength of 25 o/o under proof with water containing more than 5.6 grains per gallon of calcium sulphate, precipitates of this salt occurred at temperatures of from 80 to 86° F. but that when water containing less than 5.6 grains and more than 2.5 grains per gallon was used it remained clear at 84° F. but became distinctly cloudy and opalescent when cooled to 50° F. When water containing less than 2.5 grains per gallon was used the diluted spirits remained clear even at the lower temperature.

It was evidently necessary to repeat these experiments with Liverpool water, both that obtained from the well and that from the upland sources, Messrs Booker Bros. & Co. very kindly obtained for me a

large bulk of Liverpool well water, a smaller one of Liverpool upland water, a series of samples of "faulty" rums and a series of samples of the same "faulty" rums diluted with Liverpool water.

Upon analysis the sample of Liverpool well water was found to contain 14 grains per gallon of total solids in solution, of which 2.8 grains consisted of calcium sulphate and 2.2 grains of calcium carbonate. It also contained a small proportion of salts of magnesia. The upland water contained 5.9 grains per gallon of total solids in solution of which 1.9 grains were calcium sulphate and .4 grain was calcium carbonate.

When these waters were mixed with their own bulk of pure alcohol of 450/0 over proof both remained clear at 84° F., but when cooled to 50° the well water became slightly opalescent whilst the upland water remained clear.

The diluted "faulty" rums were next examined and the sediments separated.

Microscopically these sediments were found to consist principally of amorphous matter mixed with occasional depolarising crystals, probably of sulphate and of carbonate of calcium.

By analytical examination the major portion of the precipitate was found to be organic, whilst the inorganic matters consisted of, after ignition, calcium sulphate and the carbonates of calcium and magnesium. The bulks of these sediments were far greater than if they had consisted only of the calcium and some of the magnesium salts present in the water used for dilution.

The samples of "faulty" rum were examined by being mixed with equal bulks of distilled water, Liverpool well water, and in some cases with Liverpool upland water, using in each case duplicate samples at temperatures 84° F. and 50° respectively.

Of eleven samples examined, all remained quite clear when mixed with distilled water, both at 84° and 50° F. Those mixed with upland water also remained clear. Six became more or less opalescent when mixed with Liverpool well water at 84° and allowed to stand, whilst when mixed at 50° nine either deposited marked precipitates or had flocculent matters suspended in them. These precipitates and flocculencies were found to be of similar composition to those present in the "faulty" rums received in an already diluted state.

The investigation, therefore, indicated that the "faultiness" of the rums was due to their containing substances precipitable by the lime and magnesia salts present in the Liverpool well water, as well as to the

precipitation of part of the calcium sulphate and carbonate present in the well water by the alcohol. During this part of the investigation it was found that the amorphous organic matters precipitated by the addition of the well water to the "faulty" rums were largely soluble in solutions of caustic soda or potash, or of the hydrate or carbonate of ammonia.

Attempts were made to prevent the formation of the precipitate with Liverpool well water, by acidifying the rum slightly with acetic acid or with butyric acid, but were quite without success.

When, however, the "faulty" rum was rendered faintly alkaline by the addition of caustic soda or of carbonate of ammonia, a precipitate was produced, and after this had settled, the rum when mixed with Liverpool well water remained perfectly clear except for a slight precipitate of calcium sulphate and carbonate. These observations pointed out one mode of overcoming the difficulty by rendering the rum very faintly alkaline with caustic soda, or preferably with a solution of ammonium carbonate soon after the rum is coloured. By this proceeding the depth of colour of the rum is distinctly increased, but an objection arises with regard to the injury which may be done to the flavour of the spirits by the addition of an alkaline substance.

A further question now arose :—might not the matter precipitable by the Liverpool well water be derived from the casks in which the rum is exported and not from the spirits or from the caramel used for colouring? Several samples of freshly coloured rum were examined and were found in every case to stand the test with the Liverpool well water, only faint precipitates of calcium sulphate being produced at low temperatures whilst the bulk of the samples after mixture with the water remained clear for many days.

Samples of staves from various sources were supplied to me by Messrs. Booker Bros & Co., and were, after being split up into thin pieces, soaked in alcohol for several days. Being split into small pieces exposed relatively a large surface of the stave wood to the solvent action of the alcohol.

All the kinds of staves experimented with were found to give up colouring matters to the alcohol. After standing for two days, the alcohol was tested, and was found to remain clear when mixed with distilled water, but to give decided precipitates or flocculencies with Liverpool well water, identical in characters with those characteristic of "faulty" rum.

Owing to the greatly increased surface exposed to the action of the alcohol by the staves having been split up into thin pieces, the spirits probably took up as much deleterious matter from the wood in the short time as they would have taken up from the interior of a cask in a much longer period.

When the spirits were kept in contact with the split up staves for two or three weeks, the alcohol took up from them considerable quantities of resinous and other matters so as to produce flocculencies and precipitates when mixed with distilled water or with rain water.

Similar experiments were made with split up staves, using coloured rum which had successfully stood the test with the Liverpool water, and it was found that after being in contact with the pieces of staves for a few days the coloured rum acted in a manner not distinguishable from that in which the "faulty" rum acted when mixed at 50° F. with the Liverpool well water.

From this it appears that the deleterious substances producing cloudiness when rum is mixed with Liverpool well water probably are derived from the staves of the cask by the solvent action of the alcohol upon certain of the constituents of the wood.

Two modes suggested itself for avoiding this difficulty.—1st, the removal of the substances from the staves, and 2nd, rendering the substances insoluble in spirits.

To remove them, pieces of staves were soaked in a solution of one part of caustic soda in one thousand parts of water (equal to one pound of caustic soda dissolved in one hundred gallons of water). Although this took up from the staves much colouring matter, it did not prove quite successful. Soaking them for two days in a solution of double this strength (equal to two pounds of caustic soda dissolved in one hundred gallons of water) proved satisfactory.

To render them insoluble the following was tried :—Portions of the staves were soaked for two days in strong lime water, (lime water containing a small proportion of milk of lime) the lime water poured off and the pieces of the staves swilled with ordinary Lamaha water and allowed to drain. When staves treated in this manner were afterwards soaked in strong spirits for several days, the spirits remained perfectly clear, (except for the slight sediment of calcium sulphate from the water) when mixed with Liverpool well water at 50° F. and allowed to stand.

An occasional cause of cloudiness in rum when mixed with waters

containing salts of lime and of magnesia in solution has been met with during this investigation. In cases where considerable quantities of the higher fatty acids are produced during faulty fermentations, small quantities of these acids may pass over with the latter parts of the alcoholic distillates and produce somewhat insoluble lime soaps with the water used for testing purposes. This "fault" in rum I am inclined to think, will be seldom met with, and when detected can be obviated by care in the regulation of the fermentations, assisted by the use of lime in the retorts of the stills.

At present I am unable to discern any additional line of laboratory investigation likely to be of service in this matter and must now leave it in the hands of the Planters.

The practical points which arise from the investigation are as follows:—1st, that sellers of rum should as far as possible make a point of having their rums tested with either distilled water, clear rain water, or with Liverpool upland water, and not with water derived from the wells in the new red sandstone; 2nd, that casks intended to contain rum for shipment should be soaked for two or three days with water containing two lbs. of caustic soda to the one hundred gallons, or else with water mixed with more milk of lime than is necessary to produce saturated lime water.

After soaking, the casks must be emptied and swilled out with clean rain or trench water and allowed to drain before being filled up with rum. In my opinion the use of the lime will probably prove the more economical and satisfactory.

If these precautions do not prove successful on the large scale, it will be necessary to carry on this investigation on other lines.

J. B. HARRISON,  
Govt. Analyst.

Georgetown, 16th February, 1897.

The following Report of the Committee of Correspondence was read and adopted:—

The Museum, March 11, 1897.

R. T. A. Daly, Esq.,

Hon. Secty. R. A. & C. Society.

Sir,— I have the honour to report that, at a meeting of the Committee of Correspondence held on the 25th ult., the letter from the Philadelphia Museums, referred to the Committee for consideration, was brought

up; and I was instructed to communicate thereon directly with the Directors of the Society, since, in the opinion of the Committee, the Society had been approached by mistake instead of the Chamber of Commerce.

I was also instructed to bring to the notice of the Society the following two matters in connection with the Horticultural Show, 1896, as recorded in the minutes of the Society's meetings in the last issue of *Timehri* :—

- 1st. That in the minutes for September, page 401, line 32, the words "Mr. Quelch" occur instead of "The President."
- 2nd. That in the minutes for October, in the Committee's report, page 409, line 14, instead of the words "Chairman who undertook," the passage should read: "Chairman, Treasurer and Secretary, and Mr. L. M. Hill, who took charge of the erection and removal of the sheds and fittings; and Mr. T. S. Hargreaves, especially, who with the Chairman, undertook," etc.

And I have further, on behalf of the Committee, to request that in the next number of *Timehri*, an addenda slip be affixed with the corrections as above indicated.

I have, &c.,

J. J. QUELCH,

Hon. Secty. Committee of Correspondence.

Mr. T. S. Hargreaves gave notice of motion "That the Book Committee be asked to endeavour, where funds allow, to increase the number of reference books (up to date) in the Library."

Mr. Thomas Daly, on behalf of the Directors, gave notice of the following amendments to the By-Laws :—

At the next meeting I shall move on behalf of the Directors that the following alterations of the By-Laws be made :—

1. Addition to Chapter 1, clause 4, after the words "a Museum and Model Room" of—

"to the carrying on of a Periodical Publication as the organ of the Society;"

When amended this By-Law will read as follows :—

4. The funds of the Society shall be devoted to the establishment and maintenance of suitable Public Rooms in the City of Georgetown, for the use of Members, viz. :—A Reading Room and Library, an Exchange Room, and a Museum and Model Room; to the carrying on of a Periodi-

*cal Publication as the organ of the Society*, and to the awarding of Premiums and Grants of Money for such purposes connected with the advancement of Agriculture, Manufactures, or Trade, as the Society may deem expedient.

2. Addition to chapter 4, clause 2, after the words "affairs of the Society" of—

"; of the Local Museum, and of a Periodical Publication as the organ of the Society."

When amended this By-Law will read as follows:—

2. Directors. The six Ordinary Directors shall together with the other Office-Bearers, assist in the superintendence and management of the affairs of the Society; *of the Local Museum and of a Periodical Publication as the organ of the Society*. The three Managing Directors shall be a Committee entrusted with the exclusive management of the Reading Room and Library and shall perform the duties of such management in such rotation as they may from time to time appoint. The three Exchange Room Directors shall have the exclusive management of the Exchange Room, and may make such Rules and Regulations in relation thereto as may be deemed necessary, subject to the approval of the Board of Directors.

3. Omission from chapter x. clause 3, of the words—"forming and maintaining a Local Museum and an Experimental Garden."

Also of the words—"and establishing and carrying on a Periodical Publication as the organ of the Society."

When amended the By-Law will read as follows:—

3. The Committee of Correspondence shall be especially charged with the duty of entering into and maintaining correspondence with the Society of Arts in London and other kindred Societies, and also with Literary and Scientific individuals elsewhere; arranging for and holding Local Exhibitions from time to time; and making arrangements for the offering and awarding of Premiums.

The following Government communication in reference to sugar shipments to India was read and referred to the Agricultural Committee:—

Government Secretary's Office,  
Georgetown, Demerara,

1st March, 1897.

Sir,—I have the honour by direction of the Governor to transmit for



the information of the Royal Agricultural and Commercial Society a copy of a letter from the Emigration Agent for British Guiana at Calcutta, dated the 30th of December last, relative to the demand in India for foreign refined sugars, together with an extract from a further letter from Mr. Mitchell, dated the 6th January, on the same subject.

I have the honour to be,

Sir,

Your obedient Servant,

CAVENDISH BOYLE.

The Honorary Secretary,

Royal Agricultural and Commercial Society.

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Government Emigration Office,

21, Garden Reach, Calcutta,

30th December, 1896.

Sir,— I have the honour to submit, for His Excellency's consideration, that last year a small quantity of Beet sugar was imported from Europe as a speculation, and I am informed by those in a position to judge, that it has created a demand for foreign refined sugars, which are used in making native sweetmeats.

2. One merchant informed me he had orders for no less than 2,000 tons during the next three months, and that the demand was limited simply by his wish *festina lente*.

3. He seemed to be of opinion that the market here, for refined sugar, was practically unlimited, the expansion having been so marked in so short a period.

4. I propose obtaining samples of the qualities of sugar in most demand at an early date, and forwarding them to the Colony.

5. Hitherto about 150,000 tons of sugar, have been imported from Mauritius and other eastern Colonies, but it is only of late the importation of Beet sugar has been attempted.

6. The area under cane cultivation in India is estimated at about 3,000,000 acres, but, in Bengal especially, the cane is being largely supplanted by Jute, which not only pays better, but is infinitely easier of manipulation, the human hand representing all the machinery required.

7. The production of sugar per acre, judging by the cane cultivation I have seen, and the very indifferent crushing power at the Ryat's command, must be considerably under a ton per acre. The mill and boiling apparatus being moved from field to field as required.

8. The project has been mooted of starting a line of small steamers, fitted for the conveyance of Indian emigrants, to trade direct between Calcutta and British Guiana.

9. Such a line, financed on a rupee basis, could be made to pay, owing to the relatively low value of the white metal, as compared with gold.

10. Such vessels would bring the Colony's sugars to India at comparatively low rates of freight if they had the conveyance of the returning emigrants.

11. I have hitherto been opposed to the employment of steamers for the transport of emigrants from India to the West Indies, for several reasons. In the first place, the employment of large vessels carrying from 800 to 1,000 emigrants was contemplated, and no vessel, in my opinion, should carry over 500. Besides it is almost impossible to select such large numbers properly, and house them in Calcutta satisfactorily.

12. The cost too, would have been prohibitive owing to the absence of freight on the return voyage.

13. The risks of steamers breaking down in the more unfrequented parts of the ocean route was another of my objections, and it has not yet been provided against.

14. I think the subject of the shipment of refined sugar to India, and the best means of bringing it about, is worthy of every consideration on the part of the Colony.

I have, &c.,

(Sgd.) ROBERT W. S. MITCHELL, C.M.G.,

Govt. Emigration Agent for British Guiana.

The Honourable the Government Secretary,  
British Guiana.

*From Emigration Agent, Calcutta, to the Government Secretary.*

\* \* \* \* \*

The Jute industry to an appreciable extent supplanting Cane cultivation, and the Sugar industry of Bengal, notwithstanding the introduction of improved mills for crushing, as jute is found much more easy of manipulation and pays better.

As regards the great staple of the colony, I had been promised samples of the different kinds of beet sugar, which are now making their way with success in the markets of India, but unfortunately they have not come to hand in time to be sent by this Mail. I asked for these samples with the view of showing Planters in the Colony exactly what kind of beet sugar found the readiest market here.

If refined cane sugar could be laid down here at about twelve shillings per cwt., no doubt it would command a ready sale.

As I mentioned in my last communication on this subject, if a line of small steamers could be started from India on a Rupee in lieu of a sterling basis, to carry rice to the Colony, and bring back time-expired emigrants, with ballast cargoes of sugar instead of salt, an important trade would spring up between the two countries, which would do more to promote immigration at a lower cost to the Colony than anything else.

I would suggest that samples of the Colony's refined sugars be sent here in bags of, say, one cwt. each by the first opportunity, with the view of testing the market.

The crude product I fear would be unsaleable in India, as there is an ample supply at very low rates manufactured both from canes and dates.

I have, &c.,

(Sgd.) ROBERT W. S. MITCHELL,

Govt. Emigration Agent for B. Guiana.

Another Government communication in reference to the Cattle Diseases on the East Coast, was read and taken for notification. The Secretary was directed to forward a copy of the Veterinary Surgeon's report to Mr. G. J. Hassell.

Lothair House, Middle Street,

Georgetown, 18th February, 1897.

Sir,—I have enquired into the diseases alleged to be affecting horses and cattle in the Mahaica-Mahaicony district, and have the honour to submit that the diseases referred to have been legislated for, viz., "Influenza" affecting the horse, and "Anthrax," affecting the cattle and all other stock; but, that through non compliance with the provisions of the Ordinance, the diseases have not been controlled in certain districts, with the result, that stock owners in these districts have lost heavily, as well as seriously affecting their neighbours' stock.

From the monthly return for January, one would be led to believe having been reported, but no reliance can be placed on these returns, that the diseases have disappeared, no single case of sickness or death chiefly on account of the owners neglecting to report cases of disease or death, through indifference and timidity of having their premises declared "Infected Areas."

I would point out that Mr. Hassell evidently infringed section 5 (1) of

the Contagious Diseases (Animals) Ordinance of 1892 in not reporting the cases of disease occurring on his premises, and I would point out that if all owners act with the same indifference or purpose, it will be perfectly useless for the Government to try and eradicate any of the diseases scheduled under the Ordinance; that except the owners or managers of stock assist the Government in the matter by reporting cases of sickness or death, all the Ordinances will be unavailing to stop the progress of the disease, while the benefits which would accrue from the provisions of the Ordinance being carried out would be invaluable both from a pecuniary and the Public Health point of view. If every owner worked for the common welfare in this matter, there is no reason to doubt that the disease would be controlled in a few months, and entirely dispersed in from six to eight months.

In the district around Mahaicony Creek, where the owners have carried out proper instructions as regards disposal of carcasses and segregating diseased cattle, the disease has entirely disappeared; while in the remaining districts where no regular steps were taken, disease is prevalent.

I have, &c.,  
(Sgd.) J. HENRY BELL,  
Govt. Vety. Surgeon.

Dr. Deane said no doubt there would be difficulties in the way of getting these diseases reported; inspectors were required.

A sample of Tobacco grown and cured in the colony by Mr. G. R. Stevenson, which had been forwarded by the Government Secretary, was laid upon the table, and the covering letter taken for notification.

The Secretary read a letter from Mr. Seon stating that some of the timbers ordered were ready, but could not be floated down the river because of the lowness of the water.

Mr. Quelch called attention to the report on the British Guiana timbers lately tested at the Imperial Institute. Some of those tried were said to have been rotten, and he would recommend that the greatest care be exercised with those woods now being collected.

The Secretary was directed to call Mr. Seon's attention to the Imperial Institute Report.

The thanks of the Society were accorded for the following donations :—

To the Library—Venezuelan Boundary Map, from Mr. T. S. Hargreaves ; West India Annual, from Mr. J. N. Lightbourn ; Pamphlet on Nitrogen, &c., in Tropical Rain Water, from Prof. J. B. Harrison :—

To the Museum :—

|  |                   |     |     |                       |
|--|-------------------|-----|-----|-----------------------|
| Owl Moth ...   | ...               | ... | ... | ...Dr. Usleyde.       |
| Troupial, Skull of Waterhaas, Toucan and Ants..                            | Mr. G. S. Jenman. |     |     |                       |
| Photographs of Old Colonists, and <i>Royal</i> }<br><i>Gazette</i> of 1821 | ...               | ... | ... | Dr. Godfrey.          |
| Drain Pipes  | ...               | ... | ... | ...Mr. A. Shanks.     |
| Stone Adze   | ...               | ... | ... | ... „ Chas. Powell.   |
| Four Stone Implements  | ...               | ... | ... | ... „ J. A. Wilson.   |
| Otter  | ...               | ... | ... | ... „ M. Perreira.    |
| One Beetle with fungus   | / ...             | ... | ... | ... „ C. W. Anderson. |
| Eggs of Insects  | ...               | ... | ... | ... „ E. H. MacLaine. |
| Two rare Teal Ducks  | ...               | ... | ... | ... „ H. L. Humphrys. |
| Sternum of Fowl  | ...               | ... | ... | ... „ C. McPherson.   |
| Sword of Sword-fish  | ...               | ... | ... | ...Capt. Skolfeld.    |

The meeting then terminated.

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*Meeting held April 8th.*—Prof. J. B. Harrison, M.A., &c., President, in the Chair.

Members present 11.

Elections—*Members*: Messrs. H. Millet, W. G. Waldy, Lynch King and Julio Gonsalves.

*Associates*: Messrs. N. F. Deerr, W. W. Brassington and Cecil Campbell.

The following report of the Agricultural Committee was read :—

Georgetown, April 7th, 1897.

To the President and Members of the  
R. A. & C. Society.

Gentlemen,—I have the honour to report on behalf of the Agricultural Committee of the Society that they have carefully considered Mr. R. W. S. Mitchell's communication through the Government in reference to sugar shipments from this colony to India, and are of opinion that cane sugar of the quality referred to cannot be shipped from here and landed at Calcutta at the price named, viz., twelve shillings per cwt.

I have, &c.,

S. BELLAIRS,

Hon. Secretary, Agricultural Committee.

A Government communication referring to two samples of crystal and granulated beet sugar and two samples of Jute seed which were laid upon the table, was also read.

In reference to the Jute seed the Secretary informed the meeting that the two samples had been tested by Mr. Jenman at the Botanical Gardens, with the result that only that marked A had germinated.

The motion in reference to the amendment of certain By-Laws, of which due notice had been given, was brought forward by the Hon. Secretary, who stated that he did so at the request of the Directors.

The President stated that these amendments were proposed for the purpose of putting right an anomaly by which the Committee of Correspondence is charged in the By-Laws with certain duties which have been performed by the Directors for many years.

In reply to a question of the Hon. C. Boyle, the Secretary stated that the Journal did not pay, and the President said it cost over \$300 per annum.

The Hon. Mr. Boyle having asked if it was intended that the Journal should pay in the hands of the Directors,

the President replied that he believed there was a resolution of the Society made some ten years ago under which the Directors were empowered to continue the Journal at an expense of not more than \$500 per annum.

The Hon. N. D. Davis spoke of the use of the Journal to the Society and the value of the exchanges.

Capt. A. Duncan having seconded the motion—Mr. Bellairs, as Chairman of the Committee of Correspondence, said he had no objection to it. Although a member of the Committee for many years he had never known it to have anything to do with the Museum or the Journal.

Mr. Hargreaves said that these and other By-Laws had been systematically ignored for years. It was a remarkable coincidence that just as this matter had been brought to the notice of the Committee, the Directors had also been aroused. He could not see why the Committee should be thought incompetent to undertake these duties, seeing that six of the Directors belonged to it. Was it fair or just that the Committee who had been entrusted with the performance of certain duties, should not have the opportunity given them? Should these duties be taken from them without any explanation? Was it incompetence or what? He thought the Committee one of the most active, as might be seen by the success of their Horticultural Shows. The motion before the meeting appeared to him not to have been thoroughly understood by the Members, notwithstanding that it had been posted in the Reading Room for a month. He would therefore move as an amendment that it be left over until the next meeting.

Mr. Jacob Conrad seconded the amendment.

The Hon. N. D. Davis asked if the Committee had expressed any wish to retain these duties, to which the

President replied that for thirteen years the members had not troubled themselves about them.

On being put to the vote the amendment for postponement was carried.

Mr. T. S. Hargreaves brought forward his motion for asking the Book Committee to endeavour to procure, where funds allow, more up-to-date reference books. He said he had no idea of criticising the Book Committee, but he had heard from many quarters that the few reference books they had were a little out of date. Admitting that the Society owed much to the fact that it was a kind of Colonial "Mudie's", it must be considered at the same time that it existed for the promotion of science and useful knowledge. They would therefore scarcely be carrying out their purpose if they confined themselves too much to fiction. Although he read novels himself, he still thought standard works of reference necessary. Then, he thought, the hands of the Book Committee would be influenced by an expression of opinion from the General Meeting, for if he had brought up the matter before the Committee, they might have felt in the awkward position of having to ask the Directors for an extra grant.

Mr. Bellairs, Chairman of the Book Committee, seconded the motion for the sake of discussion, but did not see the need of it. There was a Recommendation Book in which any member might write the title of any book he wanted, and he could say that such recommendations always received careful attention. But, as a matter of fact, very few took the trouble to make entries, and the list had to be compiled by the Librarian.

The Hon. Mr. Davis, while agreeing that it was



desirable to have such books, thought that the proper place for the motion was in the Book-Committee.

The Hon. Mr. Boyle, having the Recommendation Book before him, thought some improvement might be made by giving the person who recommended a book the prior right to take it from the library.

The President said that when he was Chairman of the Book Committee the matter of reference books was fully discussed, with the result that it was said that if members wanted to know about Chemistry they might go to the Government Chemist, and if about Botany, to the Government Botanist.

On the motion being put the votes were equal, on which the Chairman gave his casting vote against it, remarking that the desired result would probably be accomplished by the ventilation of the matter.

The following communication from the Chamber of Commerce was read and taken for notification :—

The Chamber of Commerce of the City of Georgetown,  
Georgetown, Demerara,

17th March, 1897.

Sir,—I have the honour to acknowledge receipt of your letter dated 2nd instant, enclosing a communication from the Secretary of the Philadelphia Museums, which was laid before the Council of the Chamber of Commerce at its last meeting, when I was instructed to inform you that a similar letter was addressed to me by Mr. Wilson, and the matter has therefore already been dealt with by the Council.

I have the honour &c.,

G. WYATT,  
Secretary.

R. T. A. Daly,  
Hon. Secretary,  
Royal Agricultural & Commercial Society.

The Secretary read the annexed letters from Mr. Seon

in reference to the report on timbers sent to the Imperial Institute :—

Demerara River,  
22nd March, 1897.

Thomas Daly, Esqre.,

Sir,—Your letter of the 12th inst. received and contents have my attention. I have received copy of no Report, as you mentioned was enclosed, consequently I am ignorant of same. I have written to Mr. Quelch in answer to his letter and no doubt he will shew you my letter. The woods I am collecting for the R. A. & C. Society are all first class. These logs are squared timber, whilst the specimens collected last year, by me for Mr. Quelch, were round wood, and, it is to be supposed must have had a good deal of sap, and we all know such a thing as sap does not last long—only the tacouba lasts, therefore you can depend on getting good and sound timber.

I have made an offer to Mr. Quelch, which, I hope, he may see his way to accept.

Yours respectfully,  
EDWARD SEON.

Upper Demerara River,  
29th March, 1896.

Thomas Daly, Esqre.,

Hon. Secretary, R. A. & C. Society.

Sir,—Yours of the 25th inst., together with enclosed report of Mr. Allan Ransome, Technical Referee on Timbers, sent from this Colony and collected by me for the Imperial Institute, have had my careful perusal, and in answer to same, I beg to say that the report is so incomplete, unsatisfactory and contradictory, that I really cannot understand its substance. I have written a long letter to Mr. Quelch on same and I hope you may have the pleasure of seeing it.

I promise you to bring you wood which I defy anyone like Mr. Ransome to pronounce rotten or decayed; and you must bear in mind that the samples collected by me for the Imperial Institute, which is the subject of much discussion in the local press, were round wood with all the sap-wood, and it is a well-known fact that sap-wood does not last any length of time, in fact sap-wood is good for nothing in this Colony, therefore what can be thought of it in a country like England, where the

climate varies materially to our own. I say what was required in the shape of samples was square logs, 20 ft. long. I shall, I hope, be able to bring down with me, when coming, pieces of the said logs collected and on which Mr. Ransome gave us such a misleading report.

I wish you would read these few lines before the first meeting of the R. A. & C. Society.

Yours respectfully.

EDWARD SEON.

The Hon. Mr. Boyle said it was with sorrow and regret he had read the report, and he could hardly think that the professional gentleman employed by the Imperial Institute would make the mistake Mr. Seon attributed to him. He thought they should try to put the matter right by sending new samples without sap-wood.

Mr. W. Cunningham thought there must be some mistake, as the report did not agree with his long experience of the woods in question.

The Hon. Mr. Davis spoke in favour of sending other samples, and gave notice of motion for the next meeting that the Directors be asked to give effect to the Hon. Mr. Boyle's suggestion.

The following communications through the Government, in reference to colony-grown Liberian Coffee were read and taken for notification :—

Government Secretary's Office,  
Georgetown, Demerara,  
30th March, 1897.

Sir,—I have the honour by direction of the Governor to enclose for the information of the Royal Agricultural and Commercial Society a copy of correspondence received from the Secretary of State with reference to a report on Liberian Coffee grown in British Guiana.

I have, &c.,

CHARLES T. COX.

The Secretary R. A. & C. Society.

Downing Street, 23rd February, 1897.

Sir,—I have the honour to transmit to you for your information the document noted below respecting a report on Liberian Coffee grown in British Guiana.

I have, &c.,

(Sgd.) R. H. MEAD,

for Secretary of State.

The Officer administering the Govt. of  
British Guiana.

Royal Gardens, Kew,

February 20th, 1897.

Sir,—I have the honour to inform you that I have received from Mr. Morris, who is now attached to the West Indian Commission, a sample, for report, of Liberian Coffee grown on the coast lands of British Guiana, in the neighbourhood of Georgetown.

2. I enclose Brokers' report on this sample. It clearly shows that with more care the cultivation of this staple on the coast lands is perfectly practicable.

3. The Secretary of State will no doubt cause this report to be communicated to the Government of the colony, who will probably inform the grower, Mr. Thomas Garnett, of the result.

I have, &c.,

(Sgd.) W. T. THISELTON-DYER.

Edward Wingfield, Esq., C.B.,

Colonial Office, Downing Street, S.W.

Mincing Lane, London, E.C.,

February 19th, 1897.

Dear Sir,—We are in receipt of your favour of yesterday, with sample of Coffee received from British Guiana, which we have carefully examined, and beg to report as follows:—

It is good of its kind, and well dried, but has been rather roughly prepared.

We are of opinion that the coffee has not sufficiently matured, some berries come out good yellow, but others very coated and small. Many berries have been nipped and split in the pulping, and damaged.

The value of Liberian Coffee has given way recently, and quality like this would be worth about 58/ to 60/ per cwt.

Yours faithfully,

(Sgd.) LEWIS & PEAT.

The Director, Royal Gardens, Kew.

The President said that Dr. Morris had asked him to forward samples of coffee from the Canal estates as well as from those on the Demerara River, which he intended to do after the Doctor returned to England.

The thanks of the Society were accorded for the following donations to the Library—from Mr. G. S. Jenman, Veitch's "A Traveller's Notes"; from Prof. J. B. Harrison, Grenada Handbook, 1897.

The meeting then terminated.

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*Meeting held May 21st.*—Prof. J. B. Harrison, M.A., &c., President, in the Chair.

Members present 15

The President said he had much pleasure in introducing Dr. Ernst of the University of Caracas, who would make a few remarks at a later stage of the meeting.

Mr. Ed. Sutton, Editor of the "Sugar Cane," was proposed as an Honorary Member, to be ballotted for at the next meeting.

Elections.—*Member*: Rev. R. Gibson Fisher.

*Associates*: Messrs. A. E. E. Carpenter, C. L. Peacocke, H. Wallbridge, J. H. Castell and J. E. Parker.

The President, on behalf of the Directors, stated that they had decided to contribute \$100 towards a permanent Memorial of the Queen's Diamond Jubilee, and also to illuminate the buildings of the Society in a similar manner to what was done in 1887.

The Honorary Treasurer laid over the list of unpaid subscriptions for the current year, which in accordance with the By-Laws was directed to be posted in the Reading Room.

The annexed report of the Agricultural Committee was read :—

Georgetown,

May 12th, 1897.

To the President and Members  
of the R. A. & C. Society.

Gentlemen,—In accordance with the Government Regulations under which the Agricultural Committee of the Society are entitled to free analyses of articles of public interest by the Government Analyst, I have the honour to forward five analyses of clean rice, paddy and oats, which have been made at the request of the Committee.

By direction of the Committee I also forward a paper by Professor J. B. Harrison, on "The results of recent scientific researches into the agricultural improvement of the Sugar Cane."\*

I have &c.,

S. BELLAIRS,

Hon. Sec., Agricultural Committee.

Government Laboratory,

Georgetown, Demerara,

May 11th, 1897.

Sir,—I have the honour to forward herewith five certificates of analysis relating to the samples of Colony grown and imported rice, of dried and green paddy, and of oats, sent to me for analysis by the Agricultural Committee in the month of April.

You will notice that the samples of Colony grown rice compare very favourably with the one of imported rice. The grains of the Colony rice were distinctly larger in size than were those of the imported samples.

The Colony rice was slightly richer in albuminoids, fat and starch than was the imported rice, and hence possessed in a slight degree the higher nutritive value. This may be due to the fact that it was evidently the better cleaned sample.

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\* See page 84.

The compositions of the samples of paddy show that this forms a valuable food for horses, cattle, poultry, etc. Mixed with cocoanut meal (the composition of which will be found on page 64 of the Agricultural Report for 1890) in the proportions of say two of the paddy to one of the meal, a food for stock, equal in nutritive value to oats of high quality would be obtained. But, probably for use in this Colony, paddy rice, not mixed with other constituents, would be found, if fed in somewhat larger quantity, to be preferable to oats as being less heating.

I am of opinion that the sample of oats sent cannot be regarded as quite a typical sample of the oats imported into this Colony. The relatively high proportion of non-albuminoid nitrogen present leads to the supposition that the oats in question were harvested before they had become completely ripe.

At the same time, when comparing the values of paddy, rice and oats as food, it must be borne in mind that oats contain, in small quantity, an alkaloid "avenin," which apparently exercises an important influence on the effects of oats on horses, and therefore, where the animal is required to do rapid work, I am of opinion that the paddy could not satisfactorily take the place of oats. But it still, even in this case, might be used with advantage as an adjunct to, or as replacing part of the oats usually supplied.—I am, &c.,

J. B. HARRISON, Govt. Analyst.

The Honble. B. H. Jones, Chairman, Agricultural Committee.

CERTIFICATE OF ANALYSIS.

Of a sample of Creole White Rice; marked "from Maida, Berbice"; sent by the Agricultural Committee of the R. A. & C. S.; received April, 1897.

|                                       |     |     |     |     |     |               |
|---------------------------------------|-----|-----|-----|-----|-----|---------------|
| Moisture                              | ... | ... | ... | ... | ... | 11'22         |
| * Albuminoids                         | ... | ... | ... | ... | ... | 7'50          |
| † Amides and other nitrogenous bodies | ... | ... | ... | ... | ... | '31           |
| Fat                                   | ... | ... | ... | ... | ... | '52           |
| Glucose                               | ... | ... | ... | ... | ... | '18           |
| Dextrin, etc.                         | ... | ... | ... | ... | ... | 1'44          |
| Starch...                             | ... | ... | ... | ... | ... | 77'59         |
| Digestible fibre (not determined)...  | ... | ... | ... | ... | ... | '13           |
| Woody fibre                           | ... | ... | ... | ... | ... | '29           |
| Mineral matters                       | ... | ... | ... | ... | ... | '82           |
|                                       |     |     |     |     |     | <u>100'00</u> |

Remark:—1 lb. contains 22,950 grains of rice.

|                       |     |     |     |     |     |      |
|-----------------------|-----|-----|-----|-----|-----|------|
| * Containing Nitrogen | ... | ... | ... | ... | ... | 1'20 |
| † " "                 | ... | ... | ... | ... | ... | '05  |

## CERTIFICATE OF ANALYSIS.

Of a sample of Imported White Rice; marked "Imported White Rice"; sent by the Agricultural Committee, R. A. & C. S.; received April, 1897.

|                                       |     |     |     |     |     |               |
|---------------------------------------|-----|-----|-----|-----|-----|---------------|
| Moisture                              | ... | ... | ... | ... | ... | 11'34         |
| * Albuminoids                         | ... | ... | ... | ... | ... | 7'18          |
| † Amides and other nitrogenous bodies | ... | ... | ... | ... | ... | '32           |
| Fat                                   | ... | ... | ... | ... | ... | '32           |
| Glucose                               | ... | ... | ... | ... | ... | '11           |
| Dextrin, etc.                         | ... | ... | ... | ... | ... | 1'62          |
| Starch                                | ... | ... | ... | ... | ... | 76'83         |
| Digestible fibre (not determined)     | ... | ... | ... | ... | ... | '08           |
| Woody fibre                           | ... | ... | ... | ... | ... | 1'16          |
| Mineral matters                       | ... | ... | ... | ... | ... | 1'04          |
|                                       |     |     |     |     |     | <u>100'00</u> |

Remark:—1 lb. contains 24,310 grains.

|                       |     |     |     |     |     |      |
|-----------------------|-----|-----|-----|-----|-----|------|
| * Containing Nitrogen | ... | ... | ... | ... | ... | 1'15 |
| † " "                 | ... | ... | ... | ... | ... | '05  |

## CERTIFICATE OF ANALYSIS

Of a sample of Dried Paddy; marked "Dried Paddy from Maida, Berbice"; sent by the Agricultural Committee R. A. & C. S.; received April, 1897.

|  |     |     |     |     |     |               |
|--|-----|-----|-----|-----|-----|---------------|
| Moisture                               | ... | ... | ... | ... | ... | 10'36         |
| * Albuminoids                          | ... | ... | ... | ... | ... | 5'62          |
| † Amides and other nitrogenous matters | ... | ... | ... | ... | ... | 2'81          |
| Fat                                    | ... | ... | ... | ... | ... | 2'88          |
| Glucose                                | ... | ... | ... | ... | ... | '32           |
| Dextrin, etc.                          | ... | ... | ... | ... | ... | 2'18          |
| Starch                                 | ... | ... | ... | ... | ... | 68'63         |
| Digestible fibre (not determined)      | ... | ... | ... | ... | ... | 1'26          |
| Woody fibre                            | ... | ... | ... | ... | ... | 2'54          |
| Mineral matters                        | ... | ... | ... | ... | ... | 3'40          |
|  |     |     |     |     |     | <u>100'00</u> |

|                       |     |     |     |     |     |     |
|-----------------------|-----|-----|-----|-----|-----|-----|
| * Containing Nitrogen | ... | ... | ... | ... | ... | '90 |
| † " "                 | ... | ... | ... | ... | ... | '45 |



## CERTIFICATE OF ANALYSIS

Of a sample of Fresh Paddy ; marked " Undried Paddy, Maida, Ber-bice"; sent by the Agricultural Committee R. A. & C. S. ; received April, 1897.

|  |     |     |     |     |               |
|--|-----|-----|-----|-----|---------------|
| Moisture                               | ... | ... | ... | ... | 12'50         |
| * Albuminoids                          | ... | ... | ... | ... | 4'37          |
| † Amides and other Nitrogenous matters | ... | ... | ... | ... | 2'50          |
| Fat                                    | ... | ... | ... | ... | 2'76          |
| Glucose                                | ... | ... | ... | ... | '13           |
| Dextrin, etc.                          | ... | ... | ... | ... | 2'15          |
| Starch                                 | ... | ... | ... | ... | 68'46         |
| Digestible fibre (not determined)      | ... | ... | ... | ... | 1'61          |
| Woody fibre                            | ... | ... | ... | ... | 2'48          |
| Mineral matters                        | ... | ... | ... | ... | 3'04          |
|  |     |     |     |     | <u>100'00</u> |

|                       |     |     |     |     |     |
|-----------------------|-----|-----|-----|-----|-----|
| * Containing Nitrogen | ... | ... | ... | ... | '70 |
| †       "      "      | ... | ... | ... | ... | '40 |

## CERTIFICATE OF ANALYSIS.

Of a sample of Oats ; marked " Prince Edward Island Oats"; sent by the Agricultural Committee R. A. & C. S. ; received April, 1897.

|  |     |     |     |     |               |
|--|-----|-----|-----|-----|---------------|
| Moisture                               | ... | ... | ... | ... | 10'32         |
| * Albuminoids                          | ... | ... | ... | ... | 6'25          |
| † Amides and other nitrogenous matters | ... | ... | ... | ... | 5'31          |
| Fat                                    | ... | ... | ... | ... | 6'14          |
| Sucrose                                | ... | ... | ... | ... | '26           |
| Glucose                                | ... | ... | ... | ... | '25           |
| Dextrin, etc.                          | ... | ... | ... | ... | 3'76          |
| Starch...                              | ... | ... | ... | ... | 39'34         |
| Digestible fibre (not determined)      | ... | ... | ... | ... | 20'84         |
| Woody fibre                            | ... | ... | ... | ... | 5'01          |
| Mineral matters...                     | ... | ... | ... | ... | 2'52          |
|  |     |     |     |     | <u>100'00</u> |

|                       |     |     |     |     |      |
|-----------------------|-----|-----|-----|-----|------|
| * Containing Nitrogen | ... | ... | ... | ... | 1'00 |
| †       "      "      | ... | ... | ... | ... | '85  |

The following report of the Committee of Correspondence was read :—

The Museum, Georgetown,  
May 20, 1897.

R. T. A. Daly, Esq.,  
Hon. Secty. R. A. & C. Society.

Sir,—I have the honour to report from the Committee of Correspondence that all the necessary steps are being taken to further the interests of the Annual Horticultural and Poultry Show, which is to be held on Thursday and Friday, the 9th and 10th September next. Permission for the use of the Promenade Gardens has most kindly been granted by His Worship the Mayor and the Town Council, and posters and prize-lists are being distributed all over the colony through the special help of a large number of persons who have been asked to further in every way possible the objects of the Show. The prize-list has been framed on very liberal lines, and the various suggestions made by last year's Committee have been practically adopted, and it is hoped that they will considerably increase the efficiency of the Show. Copies of the prize-list are herewith enclosed.

I have further to report from the Committee for the information of the Society, that, with reference to the alterations in the Rules of the Society brought forward by the Directors, and affecting the Committee, the Committee are in entire accord with the Directorate.

I have, &c.,

J. J. QUELCH,

Hon. Secty., Committee.

The motion to amend certain By-Laws, which had been proposed and seconded at the previous meeting, was declared open to discussion, the President remarking that the Committee of Correspondence saw no objections to the alterations.

There being no discussion, they were read, put to the vote, and carried.

In connection with the Hon. Mr. Davis' motion that

new samples of timbers, without sap-wood, should be sent to the Imperial Institute for testing, the annexed Government communications were read as well as the following letter from Mr. Ed. Seon :—

Government Secretary's Office,  
Georgetown, Demerara,  
20th April, 1897.

Sir,—I have the honour by direction of the Governor to forward herewith for the information of the Royal Agricultural and Commercial Society two reports by Professor Unwin on the scientific examination of certain timbers received from British Guiana.

2. I am to request you to be so good as to return these documents when perused.

I have, &c.,

CAVENDISH BOYLE.

The Hon. Secretary,  
Royal Agricultural and Commercial Society.

SCIENTIFIC AND TECHNICAL DEPARTMENT OF THE IMPERIAL INSTITUTE.  
REPORT ON TIMBERS FROM BRITISH GUIANA.

(By Professor W. C. Unwin, F.R.S., Scientific Referee to the Imperial Institute.)

Ten planks of different timbers were received, through the Imperial Institute, in November, 1896, and four of these have been subjected to tests; the report upon the other six will follow shortly.

No. 70. GREENHEART. *Nectandra Rodiaei*.—The plank had a bad shake extending the whole length of the plank near the heart. The timber was imperfectly seasoned.

No. 71. SOUARI. *Caryocar tomentosum*.—The timber had large knots nearly in the centre, and was very wet.

No. 72. LIGHT BROWN CIROUBALLI. *Nectandra sp.*—There were shakes near the heart, extending the whole length of the plank.

No. 74. KABUCALLI. *Goupia tomentosa*.—A sound plank, but extremely wet. This timber had a strong and pungent odour.

**DENSITY TESTS.**—The following Table gives the results of the density tests on the specimens prepared for compression :—

TABLE I.—HEAVINESS.

| No. of Specimen. | Name.          | Locality.  | Weight of Wood. | Volume of Water Displaced. | Specific Gravity. | Weight per Cubic Foot. |
|------------------|----------------|------------|-----------------|----------------------------|-------------------|------------------------|
|                  |                |            | Grammes         | C. C.                      |                   | Lb.                    |
| 70               | Greenheart ... | Br. Guiana | 1,459.3         | 1,190.3                    | 1.226             | 76.64                  |
| 71               | Souari ...     | "          | 1,311.1         | 1,180.6                    | 1.111             | 69.36                  |
| 72               | Cirouballi ... | "          | 809.8           | 1,170.9                    | 0.692             | 41.18                  |
| 74               | Kabucalli ...  | "          | 1,429.0         | 1,198.5                    | 1.192             | 74.43                  |

**SHEARING TESTS.**—Shearing specimens were prepared so that the shearing plane was along the fibres, sometimes being parallel and sometimes perpendicular to the annual rings, or, at least, as nearly so as the plank permitted.

TABLE II.—RESISTANCE TO SHEARING.

| No. of Specimen. | Name.       | Locality.   | Dimensions.<br>Inches. | Area Sheared<br>Sq. in. | Shear-<br>ing<br>Load.<br>Pounds. | Ultimate Shear-<br>ing Stress, |                        |
|------------------|-------------|-------------|------------------------|-------------------------|-----------------------------------|--------------------------------|------------------------|
|                  |             |             |                        |                         |                                   | Pounds<br>per<br>sq. in.       | Tons<br>per<br>sq. in. |
| 70 b (1)         | Greenheart. | Br. Guiana. | 1.96 x 2.00            | 3.92                    | 3,645                             | 929.9                          | 0.415                  |
| 70 b (2)         | "           | "           | 1.98 x 2.00            | 3.96                    | 4,120                             | 1,040.4                        | 0.465                  |
| 71 d (3)         | Souari.     | "           | 1.98 x 2.02            | 4.00                    | 3,940                             | 984.5                          | 0.440                  |
| 71 a (4)         | "           | "           | 1.95 x 2.00            | 3.91                    | 4,010                             | 1,027.0                        | 0.504                  |
| 72 b (5)         | Cirouballi. | "           | 1.92 x 1.94            | 3.73                    | 1,630                             | 437.0                          | 0.195                  |
| 72 b (6)         | "           | "           | 1.90 x 1.94            | 3.69                    | 2,010                             | 544.8                          | 0.238                  |
| 74 a (7)         | Kabucalli.  | "           | 2.00 x 2.00            | 4.00                    | 3,240                             | 810.0                          | 0.362                  |
| 74 c (8)         | "           | "           | 2.00 x 1.95            | 3.90                    | 5,070                             | 1,300.0                        | 0.580                  |

- (1) Parallel to annual rings. Plane fracture.
- (2) Perpendicular to annual rings. Rather irregular fracture.
- (3) Parallel to annual rings. Rather irregular fracture.
- (4) Perpendicular to annual rings. Irregular fracture.
- (5) Parallel to annual rings. Plane fracture.
- (6) Perpendicular to annual rings. Rather irregular fracture.
- (7) Parallel to annual rings. Rather irregular fracture.
- (8) Perpendicular to annual rings. Very irregular fracture.

**CRUSHING TESTS.**—The crushing specimens were prisms approximately square in section, and of a height about  $2\frac{1}{2}$  times the length of side.

TABLE III.—RESISTANCE TO CRUSHING.

| No. of Specimen. | Name.       | Locality.   | Dimensions, Inches. |         | Area of Section, Sq. ins. | Crushing load, Tons. | Crushing strength, Tons per sq. in. |
|------------------|-------------|-------------|---------------------|---------|---------------------------|----------------------|-------------------------------------|
|                  |             |             | Section.            | Height. |                           |                      |                                     |
| 70 b (1)         | Greenheart. | Br. Guiana. | 2.955 x 2.994       | 8.20    | 8.848                     | 45.830               | 5.178                               |
| 71 f (2)         | Souari      | "           | 2.971 x 2.979       | 8.15    | 8.856                     | 28.99                | 3.049                               |
| 72 b (3)         | Cirouballi  | "           | 2.951 x 3.030       | 8.05    | 8.912                     | 16.865               | 1.862                               |
| 74 b (4)         | Kabucalli   | "           | 2.998 x 3.006       | 8.13    | 9.011                     | 30.625               | 3.399                               |

(1) Broke by Splitting.

(2) Broke by shearing.

(3) Drying cracks along rays before testing. Broke by shearing.

(4) Broke by vertical splitting.

The following are the results of the tests for wetness and transverse strength:—

**WETNESS TESTS.**—The bars for the transverse tests were prepared in December, and stored in a dry place till the middle of January. Hence, when tested, they were sensibly drier than the timber when received. After the transverse tests were made, drillings were taken from each bar and weighed, before and after drying, for about twelve hours in an oven at about 180° F.

TABLE IV.—WETNESS TESTS.

| No. of Specimen. | Name.               | Date of Test. | Weight of Chips.  |                        | Loss in Weight, Grammes. | Moisture per cent. reckoned on weight of Dry Wood. |
|------------------|---------------------|---------------|-------------------|------------------------|--------------------------|--|
|                  |                     |               | Initial, Grammes. | After Drying, Grammes. |                          |  |
| 70 a             | Greenheart          | 1897. Jan. 18 | 9.954             | 6.344                  | 3.610                    | 56.90  |
| 71 a             | Souari              | "             | 11.595            | 7.123                  | 4.467                    | 62.67  |
| 72 a             | Lgt. Br. Cirouballi | "             | 6.552             | 5.218                  | 1.334                    | 25.66  |
| 74 a             | Kabucalli           | Jan. 20       | 11.282            | 7.363                  | 3.919                    | 53.22  |
| 74 c             | "                   | "             | 13.744            | 9.047                  | 4.697                    | 51.92  |



TABLE VII.—CO-EFFICIENTS OF ELASTICITY FROM BENDING TESTS.

| No. of Specimen. | Name.               | Range of Stress.   | Elastic Deflection. | Co-efficient of Elasticity. |                  |
|------------------|---------------------|--------------------|---------------------|-----------------------------|------------------|
|                  |                     | Pounds per sq. in. | Inches,             | Pounds per sq. in.          | Tons per sq. in. |
| 70 a             | Greenheart ...      | 0 to 5946          | 1.436               | 2,874,500                   | 1,283.4          |
| 70 c             | " ...               | 0 to 6446          | .2508               | 2,887,300                   | 1,289.0          |
| 71 a             | Souari ...          | 0 to 5515          | .2840               | 2,353,600                   | 1,050.6          |
| 72 a             | Lgt. Br. Cirouballi | 0 to 4282          | .2936               | 1,640,300                   | 732.2            |
| 73 c             | " ...               | 0 to 4167          | .3160               | 2,469,200                   | 655.9            |
| 74 a             | Kabucalli ...       | 0 to 4746          | .4100               | 1,155,300                   | 515.7            |
| 74 c             | " ...               | 0 to 6896          | .4128               | 1,858,300                   | 829.5            |

REPORT ON THE RESULTS OF PRACTICAL TESTS APPLIED TO TEN VARIETIES  
OF BRITISH GUIANA TIMBER.

The timbers reported on were sent for the purposes of testing in March last, but as they were far too green for any reliable tests to be made with them at that time, they were kept in a dry place for six months, and were then broken down into 4-inch planks; but being still too wet to furnish reliable results, they were kept for a further period of four months before being submitted to trial. Pieces of each of the logs were passed through various machines, and although still far from being properly seasoned, they were sufficiently so to allow of an opinion being formed as to their practical value for various purposes. Of the ten logs, no less than seven already showed undoubted signs of decay, although, as above stated, they are not, even now, nearly as dry as they should be to be worked up for any practical purposes. The development of this tendency to rot so soon after the timber has been felled may be due to one of three causes: It may be owing (*a*) to the trees having been felled when full of sap; or (*b*), to the timber having been grown in a marshy locality; or (*c*), to some inherent qualities in the wood which make them liable to rapid decay. If the defect in question is due to the first of the above causes, it could be remedied by felling the trees in the winter season, but if it is ascribable to either of the other causes mentioned, it will be a serious drawback to the use, for any permanent structures, of such descriptions of timber as have already shown signs of decay. All these ten sample logs, without exception, were very easily worked by machinery, the hardest of them, viz., greenheart, being quite as easy to saw and plane as the average quality of English oak while the majority of the other samples are worked quite as easily as mahogany and cedar. The following remarks represent the results of the tests:—

**GREENHEART.** *Nectandra Rodiei*.—The sample submitted was straight grained and sound, but much softer than the greenheart hitherto used in this country, and not so durable. Hence it is not so well suited for dock gates, for which purpose greenheart is chiefly used.

**SOUARI.** *Caryocar tomentosum*.—This might serve for some descriptions of heavy timber constructions of temporary character, but as the sample submitted already showed signs of decay, it would probably be too perishable for permanent structures.

**LIGHT BROWN CIRIOBALLI.** *Nectandra sp.*—A very poor wood indeed, the sample submitted being already rotten.

**KABUCALLI.** *Goupia tomentosa*.—A coarse timber, emitting an extremely disagreeable smell when being worked. The sample was very cross grained, but as it is a tough wood and does not show signs of decay, it should be suitable for sleepers, fencing posts, and similar outside work.

**MORA.** *Mora excelsa*.—A good, sound, serviceable wood, suitable for railway carriage and wagon work and heavy constructions, for inside joiners' work and the cheaper descriptions of furniture.

**LOCUST WOOD.** *Hymenaea Courbaril*.—A mild, sound, straight grained wood, suitable for furniture, inside joiners' work, and numerous other purposes.

**SIMARUPA.** *Simaruba officinalis*.—A very poor timber, somewhat resembling poplar. The sample submitted, although not sufficiently seasoned to be fit for use, already showed undoubted signs of decay, and cannot therefore be recommended for structural work.

**HACKIA.** *Ixora ferrea*.—A good, sound, straight grained timber suitable for railway carriage and wagon work, or for heavy constructions. It might also be used for cogs and shafts, or for sleepers.

**CRABWOOD.** *Carapa Guianensis*.—Resembles cedar, and would be useful for inside joinery and for the cheaper descriptions of furniture.

**EURIBALLI.**—Something like a very inferior mahogany. The sample submitted, although still far too green to use, shows signs of decay. It might be used for cheap furniture and inside joinery.

#### REPORT ON TIMBERS FROM BRITISH GUIANA.

(By Professor W. C. Unwin, F.R.S., Member of the Committee of Advice of the Scientific and Technical Department.)

The following results complete the series of mechanical tests carried out with logs of timber received from British Guiana :—



No. 73. MORA. *Mora excelsa*.—This plank had bad shakes at each end near the heart.

No. 75. LOCUST. *Hymenaea Courbaril*.—This plank had a bad shake near the heart.

No. 76. SIMARUPA. *Simarupa officinalis*.—This plank was almost split to pieces by shakes.

No. 77. HACKIA. *Siderodendron triflorum* or *Ixora ferrea*, Benth.—Two bad shakes.

No. 78. CRABWOOD. *Carapa Guianensis*.—Very bad heart shakes.

No. 79. EURIBALLI. Bad heart shake.

The test pieces were so cut as to secure their being sound, so far as could be seen. They were kept about a month in a dry cool place; some of the transverse pieces split in drying so much that they were useless for testing.

DENSITY TESTS.—The following Table gives the result of the density tests of the specimens prepared for compression:—

| No. of Specimen. | Name.            | Locality.  | Weight of Wood. | Volume of Water Displaced | Specific Gravity. | Weight per Cubic Foot. |
|------------------|------------------|------------|-----------------|---------------------------|-------------------|------------------------|
|                  |                  |            | Grammes.        | C. C.                     |                   | Lb.                    |
| 73 c             | Mora ... ..      | Br. Guiana | 1,610.0         | 1,389.9                   | 1.158             | 72.31                  |
| 75 c             | Locust ... ..    | "          | 1,121.5         | 1,215.7                   | 0.922             | 58.58                  |
| 76 c             | Simarupa ... ..  | "          | 540.7           | 1,190.8                   | 0.454             | 28.35                  |
| 77 c             | Hackia ... ..    | "          | 1,257.7         | 1,193.2                   | 1.054             | 65.81                  |
| 78 c             | Crabwood ... ..  | "          | 762.4           | 1,029.3                   | 0.741             | 46.25                  |
| 79 c             | Euriballi ... .. | "          | 925.4           | 1,170.9                   | 0.791             | 49.36                  |

## WETNESS TESTS.

| No. of Specimen. | Name.           | Date of Test. | Weight of Chips. |               | Loss in Weight. | Moisture per cent. reckoned on Weight of Dry Wood. |
|------------------|-----------------|---------------|------------------|---------------|-----------------|--|
|                  |                 |               | Initial.         | After Drying. |                 |  |
|                  |                 |               | Grammes.         | Grammes.      | Grammes.        |  |
|                  |                 | 1897.         |                  |               |                 |  |
| 73 a             | Mora ... ..     | Jan. 18       | 11.752           | 8.058         | 3.694           | 45.84  |
| 75 a             | Locust ... ..   | Feb. 1        | 10.118           | 8.419         | 1.699           | 20.18  |
| 76 a             | Simarupa ... .. | "             | 6.896            | 5.902         | 0.994           | 16.84  |
| 77 a             | Hackia ... ..   | "             | 12.930           | 8.781         | 4.149           | 47.25  |

## RESISTANCE TO CRUSHING.

| No. of Specimen. | Name.         | Locality.   | Dimensions. Inches. |         | Area of Section. Sq. in. | Crushing Load. Tons. | Crushing strength. Tons per sq. in. |
|------------------|---------------|-------------|---------------------|---------|--------------------------|----------------------|-------------------------------------|
|                  |               |             | Section.            | Height. |                          |                      |                                     |
| 73 c             | Mora ...      | Br. Guiana. | 3.219 x 3.272       | 8.13    | 10.53                    | 33.1                 | 3.143                               |
| 75 c             | Locust ...    | "           | 2.968 x 3.078       | 8.13    | 9.23                     | 49.9                 | 5.408                               |
| 76 c             | Simarupa ...  | "           | 2.986 x 2.980       | 8.16    | 8.95                     | 15.89                | 1.755                               |
| 77 c             | Hackia ...    | "           | 3.119 x 2.873       | 8.15    | 8.90                     | 43.50                | 4.884                               |
| 78 c             | Crabwood...   | "           | 3.065 x 2.544       | 8.05    | 7.80                     | 25.71                | 3.297                               |
| 79 c             | Euriballi ... | "           | 3.991 x 2.969       | 8.05    | 8.94                     | 36.10                | 4.038                               |

73 c.—Broke by shearing.

77 c.—Broke by shearing.

75 c.—Broke by shearing.

78 c.—Broke by shearing.

76 c.—Broke by shearing.

79 c.—Broke by vertical splitting.

## RESISTANCE TO SHEARING.

| No. of Specimen | Name.         | Locality.   | Dimensions. Inches. | Area Sheared. Sq. in. | Shearing Load. Pounds. | Ultimate Shearing Stress. |                  |
|-----------------|---------------|-------------|---------------------|-----------------------|------------------------|---------------------------|------------------|
|                 |               |             |                     |                       |                        | Pounds per sq. in.        | Tons per sq. in. |
| 73 e.           | Mora ...      | Br. Guiana. | 2.00 x 2.00         | 4.00                  | 4,064                  | 1,021.0                   | 0.456            |
| 75 e.           | Locust ...    | "           | 2.00 x 2.06         | 4.11                  | 5,287                  | 1,285.2                   | 0.574            |
| 75 f.           | "             | "           | 2.01 x 1.98         | 3.98                  | 3,618                  | 908.6                     | 0.406            |
| 76 e.           | Simarupa ...  | "           | 1.98 x 1.98         | 3.90                  | 1,675                  | 429.1                     | 0.192            |
| 76 d.           | "             | "           | 1.93 x 2.00         | 3.86                  | 2,218                  | 575.2                     | 0.257            |
| 77 e.           | Hackia ...    | "           | 2.03 x 2.00         | 4.03                  | 3,510                  | 867.8                     | 0.383            |
| 77 d.           | "             | "           | 2.10 x 2.01         | 4.23                  | 5,025                  | 1,188.2                   | 0.531            |
| 78 e.           | Crabwood...   | "           | 2.01 x 1.97         | 3.96                  | 3,835                  | 967.7                     | 0.433            |
| 79 e.           | Euriballi ... | "           | 1.99 x 1.92         | 3.82                  | 4,350                  | 1,138.3                   | 0.509            |
| 79 d.           | "             | "           | 2.03 x 2.03         | 4.11                  | 3,190                  | 776.9                     | 0.347            |

73 e.—Shearing plane nearly at right angles to annual rings. Regular fracture.

75 f.—Across annual rings. Irregular fracture.

75 e.—Parallel to rings. Regular fracture.

76 e.—Parallel to rings. Smooth fracture.

76 d.—Across rings. Regular fracture.

77 e.—Parallel to rings. Regular fracture.

77 d.—Across rings. Irregular fracture.

78 e.—Parallel to rings. Regular fracture.

79 e.—Parallel to rings. Regular fracture.

79 d.—Across rings. Regular fracture.

## RESISTANCE TO BENDING.

| No. of Specimen. | Name.    | Date of Testing. | Transverse Dimensions, Inches. |        | Clear Span, Ins. | Centre Breaking Load, Pounds. | Co-efficient of Transverse Strength, |                  |
|------------------|----------|------------------|--------------------------------|--------|------------------|-------------------------------|--------------------------------------|------------------|
|                  |          |                  | Breadth.                       | Depth. |                  |                               | Pounds per sq. in.                   | Tens per sq. in. |
|                  |          | 1897.            |                                |        |                  |                               |                                      |                  |
| 73 a             | Mora     | Jan. 14          | 3'364                          | 2'958  | 45               | 6,000                         | 12,752                               | 6'144            |
| 73 b             | "        | Jan. 29          | 3'409                          | 3'051  | 45               | 8,000                         | 17,018                               | 7'596            |
| 75 a             | Locust   | "                | 3'390                          | 3'069  | 45               | 8,615                         | 18,215                               | 8'132            |
| 76 a             | Simarupa | "                | 3'463                          | 2'967  | 45               | 4,380                         | 9,765                                | 4'360            |
| 76 b             | "        | "                | 3'468                          | 3'019  | 45               | 2,480                         | 5,295                                | 2'264            |
| 77 a             | Hackia   | "                | 3'379                          | 3'047  | 45               | 9,000                         | 19,365                               | 8'646            |
| 77 b             | "        | "                | 3'397                          | 3'032  | 45               | 4,960                         | 10,774                               | 4'810            |

73 a.—Broke by crushing.

76 b.—Broke by tension.

73 b.—Broke by tension.

77 a.—Broke by tension.

75 a.—Broke by tension.

77 b.—Broke by tension at a knot.

76 a.—Broke by tension.

## DEFLECTIONS IN THE BENDING TESTS.

| Centre Load, Pounds. | No. 73a.                 |                   | No. 73b.                 |                   | No. 75a.                 |                   | No. 76a.                 |                   | No. 76b.                 |                   | No. 77a.                 |                   | No. 77b.                 |                   |
|----------------------|--------------------------|-------------------|--------------------------|-------------------|--------------------------|-------------------|--------------------------|-------------------|--------------------------|-------------------|--------------------------|-------------------|--------------------------|-------------------|
|                      | Increment of Deflection. | Total Deflection. | Increment of Deflection. | Total Deflection. | Increment of Deflection. | Total Deflection. | Increment of Deflection. | Total Deflection. | Increment of Deflection. | Total Deflection. | Increment of Deflection. | Total Deflection. | Increment of Deflection. | Total Deflection. |
| 0                    | Ins.                     | Ins.              | Ins.                     | Ins.              | Ins.                     | Ins.              | Ins.                     | Ins.              | Ins.                     | Ins.              | Ins.                     | Ins.              | Ins.                     | Ins.              |
| 500                  | 0                        | 0                 | 0                        | 0                 | 0                        | 0                 | 0                        | 0                 | 0                        | 0                 | 0                        | 0                 | 0                        | 0                 |
| 1,000                | '045                     | '045              | '060                     | '060              | '072                     | '072              | '095                     | '095              | '170                     | '170              | '050                     | '050              | '064                     | '064              |
| 1,500                | '058                     | '103              | '054                     | '114              | '041                     | '113              | '097                     | '192              | '155                     | '325              | '050                     | '100              | '056                     | '120              |
| 2,000                | '047                     | '150              | '053                     | '167              | '059                     | '172              | '090                     | '282              | '157                     | '482              | '050                     | '150              | '058                     | '178              |
| 2,500                | '062                     | '212              | '048                     | '215              | '061                     | '233              | '093                     | '375              | '160                     | '642              | '050                     | '200              | '059                     | '237              |
| 3,000                | '052                     | '264              | '045                     | '260              | '045                     | '278              | '105                     | '480              | —                        | —                 | '037                     | '237              | '053                     | '290              |
| 3,500                | '050                     | '314              | '050                     | '310              | '047                     | '325              | '087                     | '567              | —                        | —                 | '053                     | '290              | '070                     | '360              |
| 4,000                | '116                     | '430              | '090                     | '400              | '100                     | '425              | '318                     | '885              | —                        | —                 | '090                     | '380              | '110                     | '470              |
| 5,000                | '160                     | '590              | '125                     | '525              | '108                     | '533              | —                        | —                 | —                        | —                 | '060                     | '470              | —                        | —                 |
| 6,000                | —                        | —                 | '103                     | '630              | —                        | —                 | —                        | —                 | —                        | —                 | '100                     | '570              | —                        | —                 |
| 7,000                | —                        | —                 | '200                     | '830              | —                        | —                 | —                        | —                 | —                        | —                 | '140                     | '710              | —                        | —                 |
| 8,000                | —                        | —                 | —                        | —                 | —                        | —                 | —                        | —                 | —                        | —                 | '156                     | '866              | —                        | —                 |

## CO-EFFICIENCY OF ELASTICITY FROM BENDING TESTS.

| No. of Specimen. | Name.           | Range of Stress,<br>Pounds per sq. in. | Elastic Deflection,<br>Inches. | Co-efficient of Elasticity. |                  |
|------------------|-----------------|--|--------------------------------|-----------------------------|------------------|
|                  |                 |  |                                | Pounds per sq. in.          | Tons per sq. in. |
| 73 a             | Mora ... ..     | 0 to 6880                              | 0'323                          | 2,432,300                   | 1,085'8          |
| 73 b             | " ... ..        | 0 to 6381                              | 0'300                          | 2,358,300                   | 1,050'6          |
| 75 a             | Locust ... ..   | 0 to 6344                              | 0'306                          | 2,280,000                   | 1,018'0          |
| 76 a             | Simarupa ... .. | 0 to 6688                              | 0'564                          | 1,353,500                   | 604'3            |
| 76 b             | " ... ..        | 0 to 3204                              | 0'468                          | 765,280                     | 341'7            |
| 77 a             | Hackia ... ..   | 0 to 6455                              | 0'288                          | 2,483,700                   | 1,104'9          |
| 77 b             | " ... ..        | 0 to 5431                              | 0'285                          | 2,117,300                   | 945'3            |

Government Secretary's Office,  
Georgetown, Demerara,

12th May, 1897.

I have the honour by direction of the Governor to inform you that the Secretary of the Imperial Institute has forwarded a list of timbers, a copy of which is enclosed, which remain on hand of those which were forwarded to the Institute by Mr. J. J. Quelch, for examination in 1895, and Sir F. Abel has enquired whether it is desired that all of these, or if not, which of them, should be submitted to examination as in the case of those already reported on.

His Excellency will be glad to know whether the Royal Agricultural and Commercial Society wish to have the remaining samples, or any portion of them, tested. The cost will be borne by the colony.

I have, &c.,

CHARLES T. COX.

The Honorary Secretary,

Royal Agricultural and Commercial Society.

|                   |     |                                   |
|-------------------|-----|-----------------------------------|
| Purple Heart...   | ... | ... <i>Copaifera bracteata</i> .  |
| Kretti ...        | ... | ...                               |
| Washiba ...       | ... | ...                               |
| Bullet Tree ...   | ... | ... <i>Mimusops ballata</i> .     |
| Brown Cirouballi  | ... | ... <i>Nectandra sp.</i>          |
| Suradanni ...     | ... | ...                               |
| Arisowroo ...     | ... | ... <i>Vatairea guianensis</i> .  |
| Monkey Pot ...    | ... | ... <i>Lecythis grandiflora</i> . |
| Yellow Cirouballi | ... | ... <i>Nectandra Pisi</i> .       |
| Towaronero ...    | ... | ... <i>Humirium floribundum</i> . |

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|                |     |     |                                 |
|----------------|-----|-----|---------------------------------|
| Kakeralli      | ... | ... | ... <i>Lecythis ollaria.</i>    |
| Letter Wood... | ... | ... | ... <i>Piratinera Aubletii.</i> |
| Hoooboballi    | ... | ... | ... <i>Mimosa guianensis.</i>   |
| Wallaba        | ... | ... | ... <i>Eperua falcata.</i>      |
| Wamara         | ... | ... | ... <i>Swartzia tomentosa.</i>  |
| Waibana        | ... | ... | ... <i>Nectandra sp.</i>        |

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Upper Demerara River,

3rd May, 1897.

Thos. Daly, Esq.,

Hon. Sec. R. A. & C. Society,

Sir,—I have the pleasure to inform you that now the rains have set in you can expect the woods ordered at end of the present month. I shall let you know when I am loading same, so that you may inform me where you will require these woods to be put. As I have already said I am bringing samples of each specimen, also pieces of each log of those woods which I collected some time ago for Mr. Quelch for the Imperial Institute, which pieces were reported upon by Mr. Ransome. \* \* \*

Yours faithfully,

EDWARD SEON.

In reference to Mr. Seon's samples the Hon. Mr. Boyle said it would be a good thing if they were examined before being sent to England. With all due deference to Mr. Seon, he was of opinion that their last attempt to find a market for their timbers was a miserable failure. In September last he had informed them what he had done to bring their timbers into notice, and now it was near the end of May and the logs had not yet arrived in Georgetown. The merchants of London would laugh at them when they found it took over nine months to get samples.

The President stated that in this case there was excuse

for the delay, for during the nine months the rivers had been extraordinarily low through the drought ; he did not think Mr. Seon was to blame.

In the absence of the Hon. Mr. Davis, Mr. Jacob Conrad moved the motion that new samples of timber without sap-wood, be sent for trial to the Imperial Institute. They knew, he said, that it took some trouble and expense to open up new products, and if they wished to advertise their timbers they must incur this trouble and expense. Unless they made known what could be done in the colony, they could hardly expect to get outside capital.

Mr. James Gillespie seconded.

The Hon. Mr. Boyle was in favour of another trial, but a thorough examination should first be made of what they were about to send. When Mr. Seon brought down his samples they would be better able to judge, he would therefore propose as an amendment that these samples be examined, and if found good, be sent on to the Imperial Institute. In the meantime, a reply to the Government communication might be forwarded, stating that they would not ask that the remaining samples be tested, as they proposed to send others shortly.

Mr. Conrad said that Mr. Willam Cunningham would be willing to examine the timbers before shipment.

Mr. F. A. Conyers said that the timbers could not be properly tested in the colony. He remembered the Directors of the Caledonian Railway in 1885 asking about mora sleepers, but the price was so enormously beyond those of pine that they could not afford them, Timbers had been sent from here to many exhibitions. but with no benefit.

The Hon. Mr. Boyle said that his proposition was that

the timbers should be examined. He was well aware that they could not be scientifically tested here.

The Rev. D. J. Reynolds spoke of the difficulty of executing a large order if it should be received.

Mr. Gilzean said the difficulty of the abnormally dry season was seen in the high price of greenheart; last year at this time it could be bought for 18 cents a foot, now it was 45 cents, and Mr. Hargreaves confirmed this.

Mr. Æneas Mackay seconded Mr. Boyle's amendment, and the motion having been withdrawn in its favour by Mr. Conrad, it was unanimously carried.

Two letters from Mr. R. W. S. Mitchell, Calcutta, referring to a fresh parcel of Jute seed, were read.

The Assistant Secretary stated that on trial the seed had been found good, and had been distributed to about twenty different persons, some of whom had promised to give it a fair trial.

The following letter from Mr. Thos. Garnett was read, the Assistant Secretary stating that a copy of the report on a sample of Liberian Coffee, read at the past meeting, had been sent to the writer :—

Georgetown, 24th April, 1897.

Thomas Daly, Esq.,

Hon. Secretary of R. A. & C. Society.

Sir,—I am in receipt of your favour of 21st inst., enclosing copy of a communication from Kew Gardens, together with a Broker's Report on a sample of Liberian Coffee, which, I presume, is the one (and unfortunately the only one) I got cured for Mr. Morris during his visit to this colony.

I am rather at a loss to understand why this report—such as it is—has been sent to the Royal Agricultural & Commercial Society at all, and not direct to me or through the Government, considering that I personally sent Mr. Morris the sample at his special request. But this is a matter of detail.

With reference to the report itself it is not very edifying and is in parts distinctly misleading, though rather comic.

To begin with—in section 1 it is stated that the sample of Coffee was grown on the *coast lands* of British Guiana. This is misleading—as the Canal lands cannot be classed in the same category as the coast lands *proper*, owing to the atmospheric conditions being so markedly different—especially with reference to the very heavy dews at night (which the Coffee plant revels in) and the absence of the scorching salt wind by day, which latter is so prevalent on the seaboard.

In section 2 we are next solemnly told—quite as a discovery—that the cultivation of Coffee on the already-mentioned and misnamed *coast lands* is “perfectly practicable.” Now, considering that Coffee was the principal product of this Colony before sugar was ever started here, and as one only has to refer to the annals of the Colony to see how largely it was grown in the No. 1 Canal and other suitable *river* districts, this information is indeed wonderful, and is about on a par with the strange dissertations that have been appearing lately in the local press on the subject of Coffee growing in this Colony. Why, my father remembers that little property called “Java,” on Canal No. 1—which at the time was entirely in Creole (“Arabian”) Coffee—changing hands with only a handful of slaves, for £30,000! I myself have been growing both Liberian and Creole Coffee in the Canal District for a considerable number of years, and as Messrs. Lewis & Peatt’s report on my sample appears to have led some people to think that this is the first time Liberian Coffee grown here has been sent to England, I may mention that I have been shipping the same to London off and on now for some years, and my shipments have been very ably disposed of, at prices more satisfactory than those now quoted by Messrs. Lewis & Peatt.

Regretting that Mr. Morris has not been able to give us some information that would be of some material assistance to the few present Coffee growers in the Colony.

I am, Sir, &c.,

THOS. GARNETT.

The President mentioned that the letter referred to had been written by Mr. Thiselton-Dyer, and not by Dr. Morris.

Mr. Jacob Conrad spoke of the way cotton and coffee were grown in the colony by their predecessors.



The Hon. Mr. Boyle thought Mr. Garnett had just grounds for complaint. As far as he understood, Dr. Morris was supplied when here with a sample of Liberian coffee with no idea that it was to be hawked about London or to be tested. He thought that Dr. Morris should have informed Mr. Garnett if such had been his intention. It seemed as if the authorities at Kew were dealing too hardly with their struggling colony. Some time ago they said the planters should give up Sugar and scatter india-rubber seeds, and they knew what the Colonial legislature said about that. It was hardly fair or right for Dr. Morris to send an ordinary sample to his chief to be tested.

The President said that at the request of Dr. Morris he was sending samples of coffee, and that the Doctor had remarked to him that he did not consider the sample from No. 1 Canal very good.

The Hon. Mr. Boyle moved that the Society record its respectful protest against the manner in which the sample of Liberian coffee had been treated, and strongly sympathised with Mr. Garnett in the matter, and further that the protest and a copy of Mr. Garnett's letter be forwarded to the Government, with a view to their reaching Mr. Thiselton-Dyer.

This having been seconded by the Revd. D. J. Reynolds, it was carried unanimously.

The President gave a resumé of a paper entitled "The results of recent scientific researches into the agricultural improvement of the Sugar Cane."\*

On the motion of the Hon. Mr. Boyle a vote of thanks was accorded, the mover calling attention to the great value of the paper.

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\* See page 84.

Mr. Hargreaves suggested that it should be printed in pamphlet form and circulated among the members, which was agreed to.

The thanks of the Society were accorded for the following donations—To the Library—from Hon. B. H. Jones, 6 vols. *Sugar Cane*; from Dr. A. Ernst, Guide to Caracas, *Anales de la Junta de Aclimatacion*, and 4 pamphlets on the Indians of Venezuela.

To the Museum—

|   |     |                      |
|---|-----|----------------------|
| 1 Iguana, 1 Frog, 1 Fœtus of Savannah Deer    | ... | G. S. Jenman.        |
| 1 large stony Coral, and series of Shells     | ... | Barbados             |
| ...   | ... | Miss N. Harrison.    |
| 1 Acorn shell from the Lightship              | ... | Capt. Duncan.        |
| 2 Rare Insects (Mazaruni) and 1 Guilder, 1816 | ... | F. V. McConnell.     |
| 1 Brazilian Coin                              | ... | John Junor.          |
| 1 Canary                                      | ... | Lady Hemming.        |
| 1 Young Caiman and 1 Rhinoceros Beetle        | ... | Rockstone            |
| ...   | ... | Neil Menzies.        |
| 1 Beetle                                      | ... | Georgetown           |
| ...   | ... | E. Loveluck.         |
| 1 Blue Coot                                   | ... | Houston              |
| ...   | ... | Miss Bagnall.        |
| 1 Rare Swift                                  | ... | Georgetown           |
| ...   | ... | Dr. Egan.            |
| 1 Abnormal Egg of Fowl                        | ... | F. J. Bankhart.      |
| Fungus and Clay                               | ... | No. 1 Canal          |
| ...   | ... | Ramsamoye.           |
| 3 Recent Venezuelan Coins                     | ... | Dr. Ernst.           |
| Small Collection of Birds                     | ... | Rev. T. J. Toddings. |
| Baobab Seeds                                  | ... | Mrs. F. P. Smith.    |
| 44 Mixed Copper Coins and 1 Pompeian Lamp     | ... | Æ. D. MacKay.        |
| 1 Hemipterous Insect                          | ... | W. P. Kaufmann.      |
| 1 Danish W.I. Coin                            | ... | Miss Cullingford.    |
| 2 Abnormal Eggs of Fowl                       | ... | D. Bryant.           |

Dr. Ernst gave an interesting account of his researches among the Indians of Venezuela, and spoke of the value of the work of the brothers Schomburgk and of Mr. im Thurn. He also drew attention to the resemblance between the Guajiros and the Arawaks.

The thanks of the meeting were accorded to Dr. Ernst.

The President said that on the application of the Agricultural Committee the Government had kindly forwarded a hundred copies of the "Report on the Agricultural Work in the Botanic Gardens, 1893-5," for distribution among the members interested in agriculture, and a vote of thanks was accorded.

The meeting then terminated.

*Meeting held June 10th.*—Professor J. B. Harrison, M.A., &c., President, in the Chair.

Members present 12.

Mr. Edward Sutton, Editor of the *Sugar Cane*, Manchester, was elected an Honorary member.

The following Report from the Committee of Correspondence was read :—

The Museum, June 10, 1897.

R. T. A. Daly, Esq.,

Hon. Secy, R. A. & C. Society.

Sir,—I have the honour to state for the information of the Society, that, with reference to the communication of the Government asking for a supply of certain colonial fibres, the Committee of Correspondence are taking steps to procure the samples asked for.

I have, &c.,

J. J. QUELCH,

Hon. Secy., Com. of Correspondence,

The following communication of the same Committee was read :—

The Museum, June 10, 1897.

R. T. A. Daly, Esq.,

Hon. Secy. R. A. & C. Society.

Sir,—Referring to the letter of the Government Secretary (No. 2,092, 14th April, 1897), concerning a supply of creole fibres, I have the honour to inform you that the question of growing fibres was brought up at a meeting of the Committee of Correspondence of the R. A. & C. Society, on the 3rd inst., and it was thought that, as the import of bags

to hold sugar amounts to several hundreds of thousands per year, and as it is hoped that many more will soon be required for rice, the Government might see their way to offer a premium of five hundred pounds (£500) sterling to any person who will produce and place upon the market a bale of bags suitable for packing sugar and rice at a price not exceeding current rates for ordinary bags—the bags to be woven in the colony and made in the colony; and the materials used to be exclusively grown and manufactured in the colony—such premium to remain open for five years.—I have, &c.,

J. J. QUELCH,

Hony. Secy. Com. of Correspondence.

On the motion of Mr. F. A. Conyers, seconded by the Hon. B. Howell Jones, the suggestion was adopted.

In reference to the President's paper on the Agricultural Improvement of the Sugar Cane, copies of which had just been received from the printers, it was agreed that discussion be postponed until the members had the opportunity of perusing it.

The Hon. Mr. Jones laid on the table samples of tobacco grown and cured in Leguan, by Mr. Waith, which he thought very encouraging for a preliminary experiment. Some of the produce had been prepared into cigars and another portion into ordinary smoking tobacco, and it had been a financial success. Whether, in view of the fact that the Government might impose an excise duty, it would be desirable to recommend the industry, was doubtful, but as long as the advantage of freedom from duty was in the hands of the grower, it might be carried on.

The President spoke of the way imported tobacco was adulterated. Instead of about 13 per cent. of water, it often contained over 40 per cent.; it would therefore be highly desirable that the growing of tobacco should be encouraged.

Mr. Hargreaves gave notice of motion as follows :—

"That the Society offer premiums for the best sample of colony grown and cured tobacco, and cigars made from such tobacco, and that the Government be asked to bring forward a motion in the Combined Court for granting a sum in aid."

In reference to certain analyses of rice laid over at the previous meeting, the Hon. Mr. Jones reported that he had received a letter from the Government Analyst highly favourable to the colony grown article as compared with that which was imported.

The Secretary reported that Mr. Seon had written stating that he was leaving with the timbers ordered for town on the 7th instant. Mr. Daly also stated that arrangements had been made for examining the logs, and if satisfactory, shipping them by the Godiva or Nonpareil.

The Hon. Mr. Jones spoke of a log of greenheart taken from a house in Leguan, to all appearance sound, having been discovered, on attempting to utilise it for a fishing rod, to be so exceedingly brittle as to be useless.

The thanks of the Society were accorded for the following donations :—

To the Library—

From Mr. R. M. Clegg—The Burns Calendar ; Wm. Burnes' Manual of Religious Belief, and B.G. Catalogue of Exhibits to Exhibition of 1851.

From the President—J. B. Harrison's Rocks and Soils of Grenada and Carriacou.

From Dr. Ernst—Alegato de Venezuela ; President Crespo's Message, 1897 ; Contribucion al Estudio del Cafe en Venezuela.

To the Museum—

Alligator Eggs      ...      ...      ...      ...Capt. Cameron.

- 1 Dime, 1876... .. Albert Sears.  
 White Hassar ... ..from Surinam ...J. J. Kirke.  
 ‡ Guilder, 1832, and 1 do., 1833 ... ..S. M. Bellairs.  
 1 Cicada ... ..F. A. Conyers.  
 12 Photographs of Ships of the British Navy ... R. M. Laird.

The Assistant Secretary called attention to a specimen of an Orchid, *Catasetum deltoideum*, standing on the table, which he said was interesting from the fact that it had two distinct forms of flowers on one spike, the upper typical flower being a male and the two below females.

Mr. Luke M. Hill presented the following copy of the analyses lately made by the Government Analyst, of the different artesian well waters in Georgetown and near by, which he thought it desirable should be incorporated with the minutes of the Society. He understood that these waters were formerly recommended as a medicine.

Composition of the Waters yielded by the Artesian Wells in and near Georgetown. Results given in Grains per Imperial gallon at 80° Fahr:—

|                        | New North Street,<br>under Museum. | W. & lot, 80, Nor-<br>ton Street, Werk-<br>en-Rust. | Houston, E. Bank,<br>Demerara. | Fort Street, King-<br>ston. | Chapel Alley,<br>Charlestown. | Parade Ground,<br>Carmichael Street. | Cummingsburg<br>Market. | 78, Main Street, S.<br>Cummingsburg. | Fort William<br>Frederick. | Market Square. |
|------------------------|------------------------------------|---|--------------------------------|-----------------------------|-------------------------------|--------------------------------------|-------------------------|--------------------------------------|----------------------------|----------------|
| Ferrous bicarbonate... | 3.67                               | 1.70  | 7.92                           | 1.22                        | 7.85                          | 12.02                                | 9.26                    | 4.28                                 | 3.92                       | 4.30           |
| Calcium sulphate ...   | traces                             | traces  | .91                            | 1.21                        | 3.22                          | 3.22                                 | 3.06                    | 3.40                                 | .97                        | traces         |
| Calcium chloride ...   | ...                                | 4.71  | ...                            | 8.70                        | ...                           | ...                                  | ...                     | ...                                  | ...                        | ...            |
| Calcium carbonate ...  | 12.50                              | ...   | .73                            | ...                         | ...                           | ...                                  | ...                     | ...                                  | .53                        | 6.75           |
| Magnesium sulphate...  | ...                                | ...   | ...                            | ...                         | 3.58                          | 1.03                                 | .91                     | 1.77                                 | ...                        | ...            |
| Magnesium chloride...  | ...                                | 19.89   | 21.37                          | 31.12                       | 7.25                          | 5.41                                 | 4.88                    | 11.01                                | 2.29                       | 4.32           |
| Magnesium carbonate... | 25.32                              | ...   | ...                            | ...                         | ...                           | ...                                  | ...                     | ...                                  | 3.86                       | 1.84           |
| Potassium chloride ... | 13.71                              | 3.89  | 6.10                           | 5.65                        | 1.22                          | 1.60                                 | 1.62                    | 2.13                                 | 1.21                       | 1.21           |
| Sodium chloride ...    | 202.41                             | 37.43   | 25.90                          | 11.77                       | 21.66                         | 19.59                                | 17.88                   | 11.94                                | 13.79                      | 11.29          |
| Sodium carbonate ...   | 8.95                               | ...   | ...                            | ...                         | ...                           | ...                                  | ...                     | 3.60                                 | 4.65                       | ...            |
| Silica... ..           | 1.20                               | 3.60  | 3.70                           | 1.10                        | 2.35                          | 4.10                                 | .60                     | 3.60                                 | 4.65                       | 1.20           |
| Phosphoric anhydride.  | .82                                | .10   | .11                            | .31                         | .03                           | .04                                  | .05                     | .04                                  | .02                        | .03            |
|                        | 268.58                             | 70.32   | 66.74                          | 61.08                       | 47.16                         | 47.01                                | 38.26                   | 38.17                                | 31.24                      | 30.94          |
| Ammonia ... ..         | .002                               | .066  | .042                           | .044                        | .031                          | .002                                 | .034                    | .007                                 | .021                       | .001           |
| Albuminoid Ammonia     | .036                               | .038  | .036                           | .039                        | .004                          | .008                                 | .010                    | .008                                 | .095                       | .017           |

J. B. HARRISON, Government Analyst.

Government Laboratory, Georgetown, Demerara, 27th April, 1897.

Mr. Hargreaves said it had been suggested to him by a soda water manufacturer that perhaps these well waters might be used to advantage in his business. The President in reply stated that they would act as purgatives.

The Assistant Secretary said that somewhere in the thirties there was a "Demerara Spa" in Main Street, with baths, drinking counters, a reading room and all the necessities of such fashionable resorts.

Mr. Jacob Conrad spoke of the same waters having been once used by the physicians at the Garrison.

Mr. Luke M. Hill was thanked for the document, which it was agreed should be incorporated with the proceedings of the Society.

In reply to a question of Mr. Conrad, the President said that the Directors had not altered their decision to illuminate their buildings at the Diamond Jubilee.

Mr. Hargreaves spoke of the Jubilee Committee's recommendation *not* to illuminate in Water Street, and asked that the rules be suspended to allow him to make a motion at once. In view of the opinion that it was undesirable to incur even the slightest risk to their valuable collections, and the general acceptance of the Committee's recommendation, he would ask that the building be not illuminated.

The rule having been suspended, the motion was seconded by Mr. Luke M. Hill and carried by a majority.

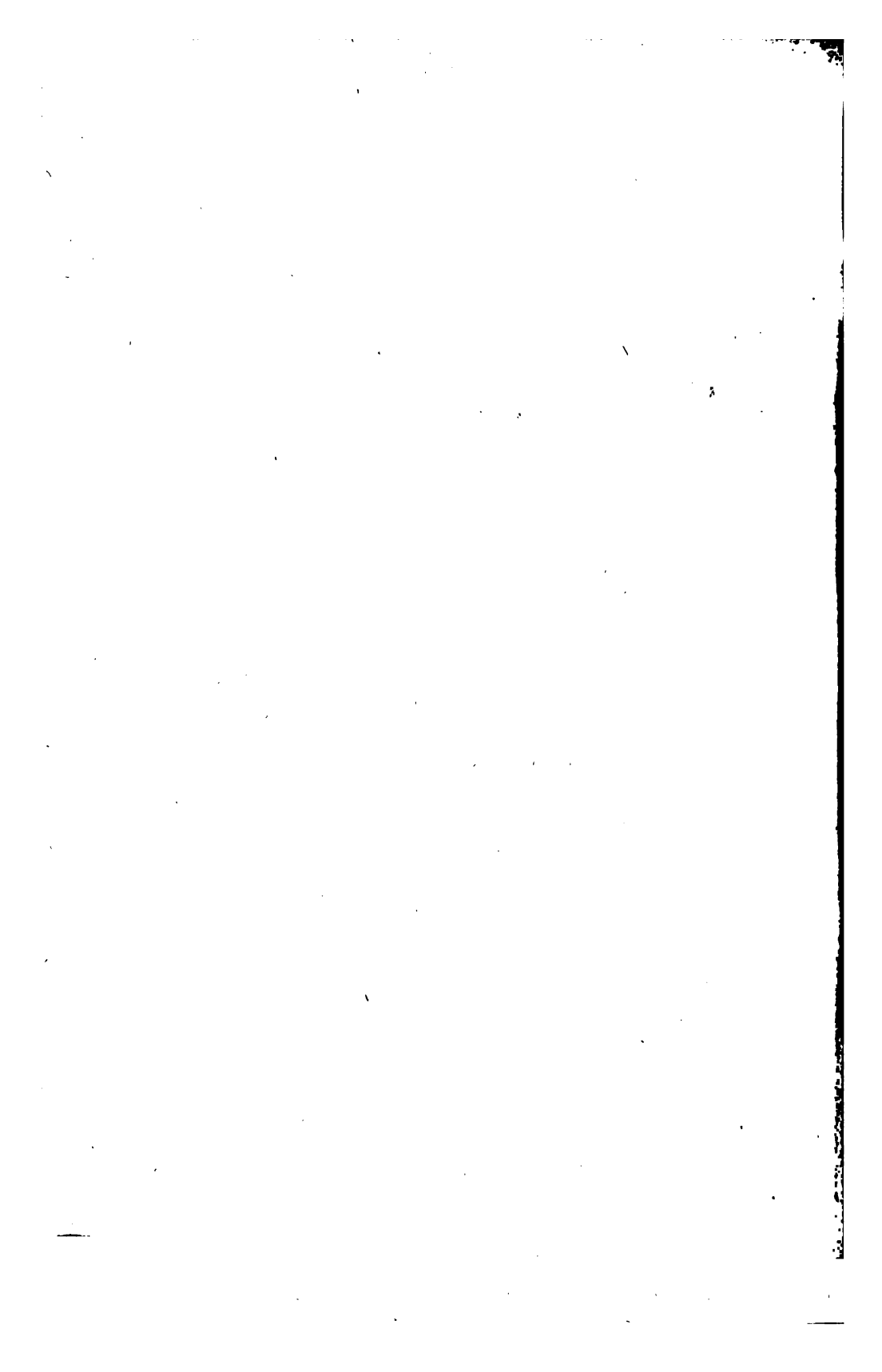
The meeting then terminated.

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ERRATUM.

On page 150, column B, No. 12, for 147 read 117.

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## *Some Neotropical Birds.*

*By C. A. Lloyd.*

**I**N SCLATER's scheme of Natural History Provinces, which is now almost universally accepted by Zoologists, taking birds as his guide, he divides the world into six Primary Regions. Of these the one to which British Guiana belongs—the Neotropical—is, with the exception of the Australian, the richest in birds, both with regard to the number of peculiar species as well as in the brightness of their plumage.

It is true that we have nothing to surpass the superb Impeyan, Peacock and Argus Pheasants of the Eastern Hemisphere, but when we arrive at such groups as the Cotingas, the Tanagers and the Humming-birds we are presented with an array of brilliant forms unparalleled in the Ornithological World.

Before proceeding further, however, it is necessary to remark that the Neotropical Region embraces South and Central America, Southern Mexico and the West Indian Islands.

To constitute a Natural History Province, it is requisite that at least one half of the species should be peculiar, a condition which, with respect to its bird-life, is admirably exemplified in the Neotropical Region, no less than twenty-three families and some six hundred genera being absolutely restricted to it.

The humming-birds (*Trochilidæ*), although not confined to the Neotropical Region, are highly characteristic of its *Avifauna*, and of the four hundred and seventy-

six species at present known, only eighteen or twenty barely straggle within the boundaries of the North American or Nearctic Region.

Excluding the birds of Paradise, no other family contains so many curious and strangely adorned forms as the Humming-birds. Among the more remarkable species may be mentioned the unique *Loddigesia mirabilis*, *Lophornis Helenæ*, the Short-tailed Wood Star, *Acestrura micrura*, *Sappho sparganura*, and the singular *Spathura underwoodi* with its snow white "tibial tufts." Notable British Guiana forms are the King Humming-bird *Topaza pella*, *Discura longicauda* and *Campylopterus largipennis*. The last is remarkable for the singular development of the first primary in the males, the shaft of which is abnormally enlarged.

In the Islands, three lovely little humming-birds belonging to the Genus *Bellona* are met with ;—One *B. exilis*, an elegant little creature with a glittering blue crest, is very common in the Island of Anguilla, frequenting the Loblolly trees (*Pisonia subcordata*) and nesting amongst the branches.

Next to the humming-birds in point of beauty, come the Cotingas (*Cotingidæ*), the Tanagers (*Tanagridæ*) and the Manakins (*Pipridæ*) groups rich in remarkable and beautiful species. The first two families are strictly Neotropical in their range, but the last occurs in the Nearctic Region as well, though the species are most numerous within Neotropical limits.

About one hundred and ten species of Cotingas have at present been recorded, some two dozen of which are natives of British Guiana. The family embraces such splendid forms as the Cock-of-the Rock, *Rupicola crocea*

the blood red military Chatterer *Hæmatoderus militaris*, the Pompadour Cotinga *Xipholena pompadora* and the singular Bell-bird *Chasmorhynchus niveus*.

The Manakins (*Pipridæ*) form a group comprised of about seventy species, referable to nineteen genera. They are small forest dwelling birds of bright plumage, and of the seventeen species recorded from here the most notable are *Chiroxiphia pareola* and *Ceratopipra cornuta*.

The Tanagers as already stated, although penetrating into the Nearctic Region, are mainly a Neotropical group. Common types of the family are the Blue Sackie, *Tanagra episcopus*, the Cashew Sackie, *Rhamphocælus Jacapa*, and the palm Sackie, *Tanagra palmarum*. The family is comprised of fifty-nine genera and nearly four hundred species, one of the genera, *Calliste*, containing some of the most gaudy of all birds, e.g., the Rainbow Tanager, *Calliste tatao*, which well deserves its popular title.

Other fine and bright plumaged groups are the Jacamars (*Galbulidæ*) the Trogons (*Trogonidæ*) the pretty little Guit-guits, or sugar birds (*Cæribidæ*) and the Toucans (*Rhamphastidæ*).

Of the twenty-three bird-families peculiar to the Neotropical Region, the following eight are worthy of special note :—

|                        |     |                        |
|------------------------|-----|------------------------|
| <i>Steatornithidæ</i>  | ... | ... <i>Cariamidæ</i> . |
| <i>Palamedeidæ</i> ... | ... | ... <i>Psophiidæ</i> . |
| <i>Opisthocomidæ</i>   | ... | ... <i>Tinamidæ</i> .  |
| <i>Eurypygidæ</i> ...  | ... | ... <i>Rheidæ</i> .    |

The first and third families contain each a single species, viz : the Oil bird or Guácharo (*Steatornis Caripensis*) and the Hoatzin (*Opisthocomus hoatzin*) a bird

possessing morphologically many points in common with the reptiles.

In most existing birds the merrythought (furculum) is united to the breast bone (sternum) by a fibrous tissue as in the common fowl, but in the Hoatzin it anchyloses with the breast bone below and with certain other bones of the shoulder girdle above, so as to form a solid piece, an antique type of structure which was only known to have existed in the extinct Dodo. Young Hoatzins have their wings furnished with well developed hook-like claws, by means of which they are enabled on the slightest alarm to leave their nests and clamber (on all fours as it were) about the vines and tangles of the nesting tree.

The Guácharo is a sort of aberrant goatsucker, remarkable as being about the only true frugivorous night bird known. It was discovered in 1799 by HUMBOLDT and BONPLAND in Venezuela in the cave of Caripé, hence its specific name of *caripensis*. In this country it has been reported from a cave on the Upper Mazaruni River and from the vertical cliffs of Roraima.

Very remarkable types are also contained in the remaining six families, such as the Cariamas, a singular group of birds which have given Ornithologists some trouble in assigning to their proper position in the series, some systematists considering them to be the American representatives of the Secretary bird of the Cape and placing them accordingly among the *Falconidae*. Their proper place however seems to be between the Cranes and Trumpeters.

Another singular species is the Horned Screamer, *Palamedea cornuta*, which despite its unwebbed feet is nearly allied to the geese. This bird presents several

structural peculiarities. Its skin, owing to loose cellular tissue beneath filled with air, is what is known as *emphysematous* or bloated, producing when touched the sensation of handling a bladder; its ribs lack the uncinatè processes (a unique structure in birds) and a slender horn-like organ of about three inches in length springs from the middle of the head, a character upon which both its specific and popular names are based. The Horned Screamer and two other allied forms comprise the family *Palamedeidae*.

The *Eurypygidæ* or Sun Bitterns are a small family of only two species, the common Sunbird *Eurypyga helias* and the Central American form *E. major*. Although called Bitterns they differ much in appearance from those birds, and their affinities are with the Cranes. The eggs of the common Sunbird are said to be very like those of the curious Kagu of New Caledonia, but smaller in size.

The Warracaba, *Psophia crepitans*, and the large Maam, *Tinamus subcristatus*, may be taken as the types of the families *Psophiidae* and *Tinamidae*, the former of which contains five species and the latter more than sixty.

The Warracaba is the only member of its family as yet recorded from British Guiana, but on the Upper Essequibo and Potaro Rivers I have met with a form differing from it not only in size and in the colour of its tarsi (legs) but also in habits. Unlike the common *Psophia crepitans* this bird never goes in large flocks, but is found in small companies of four or five, or in pairs.

The Maams (*Tinamidae*) are a most interesting group forming a sort of connecting link between the Carinate and Struthious birds, (ostrich family), agreeing with the

latter in the structure of the skull and with the former in having a keeled sternum or breast bone. They are also remarkable for their curiously coloured eggs, the shells of which are very smooth and shining, appearing as if made of Ivory. About six species of these birds are recorded from here, the best known of which are the large Maam and the Mamoo Swagger *Crypturus variegatus*.

Nearly allied to the Old World Ostriches are the *Rheidae* or Rheas. The family is not represented in Guiana being only met with in the extreme Southern and Central parts of the Neotropical Region. They differ from the Ostriches in their smaller size, and chiefly in the structure of their feet, which have three toes instead of two.

These birds have very remarkable nesting habits. Several hens lay together in the same nest and when a sufficient number of eggs have been deposited, the male bird performs the duties of incubation and cares for the young when they are hatched.

The Rheas number in all four species, but of one of them *Rhea nana* nothing appears to be known but the egg. An albino variety of *R. americana* is sometimes met with.

With the exception of the magnificent Ocellated Turkey, *Meleagris ocellata*, of Honduras and Yucatan, the Neotropical game birds are all of exceedingly sober plumage, but nevertheless many fine and striking forms may be found among the Curassows or Powises (*Cracidæ*) and the Guans or Marudies (*Penelopinæ*.)

These birds together with the turkeys (*Meleagrinæ*) are amongst the largest of the game birds, the latter re-

placing in America the gorgeous Pheasants of the Old World.

About three species of wild turkeys are known, two occurring in North America and one, the Ocellated Turkey, mentioned above, on this side of the Continent. The Powises and Marudies, however do not occur away from the Neotropical Region, where they have a very wide distribution. With regard to the birds of prey, the Neotropical Region is the exclusive home of the finest members of the Order. The Harpy, *Thrasaetus harpyia*, the largest raptorial bird, the Condor, *Sarcorhamphus gryphus* and the King Vulture, *Gypagus papa*, are entirely confined to it. Besides these a host of other smaller but handsome forms abound.

In the Lesser Antilles the Order is very poorly represented, only one pretty little Kestrel, *Cerchneis dominicensis*? being indigenous to them. This bird is known in the Islands as the "Killie Killie" from its cry, and is a very bold and courageous species.

The Mesomyodian, or songless division of the *Passeres* (Perching birds) being almost entirely confined to America, it is not surprising that most of our birds should have little or no powers of song. Indeed I once heard a little tree frog with a much more melodious voice than many of our wild birds. So strange and unusual was the call of this little creature, that we stopped paddling our boat for a long time listening to it.

In British Guiana the common house Wren, *Troglodytes furvus*, the Music Wrens, *Cyphorhinus* sp. and certain members of the Tanagrine Genus *Euphonia* are among the best songsters, but in every case the song is very short and never continuous as in the far famed Nightingale.

The note of the Quadrille bird, *Cyphorhinus musicus*? is really most singular, and when heard for the first time, it is hard for one to realize that he listens to a bird and not to some wandering urchin trying to whistle a strange air. In my opinion the whistle of this little songster is even more remarkable than the metallic "Cling! Clong!" of the bell-bird, which does not sound like a bell at all and loses much of its strangeness if heard at close quarters.

High mountain ranges, deserts, and differences of climate, as is well-known, often exercise a great influence on the Fauna of a Country, forming, according to Buffon, "natural barriers," effectually retarding the migration of species. Very narrow stretches of sea also seem to operate in the same direction, and in the Antilles the distribution of certain species of birds is somewhat curious.

Judging from the propinquity of their Coasts, anyone would suppose that the Fauna of the Islands of Jamaica and Haiti would be exactly similar, but it is not the case. Neither the black nor the red-headed Carrion Vultures *Catharista atrata* and *Rhinogryphus aura*, which form such a conspicuous feature in the bird-life of Jamaica are met with in Haiti. On the other hand Haiti is the home of a mammal, *Solenodon paradoxus*, unknown in Jamaica, and which singularly enough has its nearest living allies in the Tenrecs of Madagascar.\*

That a mammal should be confined to one of a group of Islands separated only by a narrow sea is not so surprising, but that a bird endowed with excellent powers of flight should for the same reason be prevented from migrating is very extraordinary.

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\* A second species of *Solenodon* has been found in Cuba.



Perhaps the Carrion Vultures originally crossed over from Florida to Cuba, and from thence to Jamaica, but Haiti being the more Windward Island they were unable to fly against the heavy trade winds.

From Jamaica and Haiti up to the Virgin Islands the Old Witch, *Crotophaga ani*, is a commonly occurring species, but it is absent from Antigua, St. Kitts and Anguilla, and so far as I am able to ascertain is not met with again until Trinidad and the neighbouring Islands are reached. In British Guiana it is joined by a second species, *C. major*, which is not found in Venezuela, while a third form, *C. sulcirostris* appears to be confined to Central America.

The Old Witch is a very weak flyer and it is easy to imagine how the line of migration in the Antilles may have become interrupted.

Between the Virgin group of Islands and Anguilla there is a comparatively wide and unobstructed sea, which would prove an impassable barrier to a bird of feeble flight; but on the other hand that portion of the Caribbean lying between the Virgin Islands and Haiti is dotted with islets, so that the Old Witch may easily have passed from one to the other at a time when they were larger and closer together, or perhaps united.

The original home of the Old Witch and Carrion Vultures was most probably the South American Continent, from whence they migrated to the West Indies, but it is evident that the migration of the former species must have taken place when the configuration of the Islands was very different from what it is now, and at a period much anterior to the migration of the Vulture, or the species would be co-existent.

Several pairs of Old Witches have quite recently been taken to Antigua by Mr. F. E. WARNEFORD with the view of checking a plague of ticks infesting his cattle. When last heard of the birds were quite at home, flying about his farm; it is therefore not unlikely that they may soon become naturalized in the Island.

The distribution of the *Cærebine* Genus *Certhiola* is also rather remarkable, nearly all of the species being peculiar to the country in which they are found. Thus *Certhiola sancti-thomæ* is confined to the Island of St. Thomas, *C. bartholomica* to St. Bartholomew and *C. portoricensis* to Porto Rico. A very handsome species commonly known as the "Yellow-breast Sparrow" occurs in Anguilla and may be peculiar to that Island. The British Guiana form *Certhiola chloropyga* is a very ugly and dull plumaged bird.

Mr. QUELCH has lately contributed to this Journal an exhaustive paper on the migratory birds, so that nothing remains to be noted on that interesting subject, but I may here embrace the opportunity of recording that the little Golden Warbler, *Dendroica æstiva*, which seems to be only a migrant here, breeds regularly in Anguilla, where it is known as the wild or bastard Canary. The nest, which resembles that of a very large humming-bird, is usually placed between the forked branch of a low shrub and is composed of fine grass mixed with vegetable down. The eggs are white, freckled with brown.

In the foregoing notes many of our remarkable birds remain unnoticed, but some idea may be gathered from what has been said of the highly interesting nature and splendour of the Neotropical Avifauna.

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## *Abortive Colonial Publications.*

*By the Editor.*

**I**N the old files of Colonial newspapers we come across curious announcements, some of which are obviously "skits," while others, may or may not be genuine. In the "Guiana Chronicle" for 1822, are three such advertisements, the first of which, issued no doubt in good faith, is interesting for its reference to CHARLES WATERTON; it is from the paper of June 10th, and runs as follows:—

"Proposals for publishing by Subscription, Enchiridium or Guide into the woods and uninhabited wilds of Demerara; being Remarks and Observations on some objects of Natural History and Botany; compiled and arranged from Notes taken in the years 1820, 1821, and part of 1822, while engaged in making a Collection of objects of Natural History: by WILLIAM FRASER, M.D., and Surgeon, late of Edinburgh.

### CONDITIONS.

1st. The above Work is proposed to be published by subscription in one volume, octavo, to contain 150 pp. or thereabouts; and accompanying which, a few explanatory plates, engraved expressly for the work by an eminent artist of Edinburgh, will be given.

2nd. The Work will be put in the Press when a sufficient number of Subscribers is obtained.

3rd. It will be printed on fine wove demy paper.

4th. Price to Subscribers £44, to Non-subscribers £55: to be paid in cash on delivery of the Work.

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**PROSPECTUS.**

The Author of the Work, now offered with every due deference to the notice of the public, does not obtrude himself from the vanity of appearing with his name affixed to any production, however great, or however meritorious its pretensions as a publication may be ; for in either respect, he presumes not to arrogate to it the smallest title. He does not promulgate any remarks or observations of his from their possessing any peculiar claim to originality ; neither does he impertinently push forward the offspring of his leisure hours as possessing intrinsic worth suited to the undertaking he ventures thus to lay before them ;—his sole object being to communicate to others, who may labour under difficulties similar to those he himself encountered at the first set out of his rambles into the wilds and impenetrable depths of the forest, such local information, as circumstances connected with their plans and projected excursions into the pathless waste, or dreary solitude, may stand in need of.

A local guide, of any description, was a desideratum felt with much earnestness by the Author ; and having been without the aid of a book of reference, he laboured under an inconceivable difficulty at the first outset—ignorant of the precise topography of the country—fearful of being lost amidst the wooded entanglements of the matted “Bush”—unacquainted with the chosen spot, and favoured tree of resort of the rare and beautifully plumaged race, he groped as it were in the dark until well-bought experience had taught what bush to beat and covert to search.

One friend—a much valued friend, chance threw in his way, and to him he stands deeply indebted. The greatest

part of his friend's life had been allotted to the self-imposed task of prosecuting, with the fullest ardour, the study of Natural History. He was inured, consequently, by long experience, to a practical and thorough knowledge of the numerous and varied difficulties which oppose the naturalist in the course of his excursions into the forest—his steering up and down creeks, or traversing, under the direct and scorching rays of a tropical sun, the open and unsheltered savannahs. To his indefatigable labours Natural History stands much and justly indebted, and in a more especial manner the Ornithologist, upon whose department he has bestowed the most unremitted labour, and unwearied assiduity; and has thus brought the art of preserving and mounting (with extreme nicety and elegance) of its various interesting objects to the greatest degree of perfection. When thus unsolicited, and without the least privilege, the present writer makes allusion to a gentleman of acknowledged worth and independent fortune, he does so with the utmost possible regard towards him; and in naming CHARLES WATERTON, Esq., of Walton Hall, Yorkshire, as the friend to whom he owes so much, as his instructor and monitor in treading the intricate path of Natural History, he does no more than his merits, under every circumstance in which they can be viewed, justly entitle him to. Without his aid the Author had been as well out of "*the Bush*" as in it; he knew nothing: he profited by his advice; he gained wisdom and understanding in Natural History by his instructions.

In the Work now offered to the consideration of an indulgent public, the Author purposes to lay before them a succinct account of such animals as came under his

immediate observation; and whose peculiarity and habitude of life called forth his attention to investigate, as closely as possible, their manners and mode of propagating their kind, or the purposes designed, as far as can be traced, by the great Author of their being, in calling them into existence.

It is to be regretted, however, that some objects, particularly among the feathered tribe, whose beauty never fails to excite rapturous admiration in the mind of every beholder, from the shy and solitary habits they lead, are hardly known beyond the branches of the *feeding tree*, to which they resort, and on which they become a prey to the watchful and wary Naturalist.

The manners and habits of life of the Indians or "*Bucks*," along with many of their superstitious motives and *conceits* will also fall under the consideration of the Author.

Many of the quadrupeds and reptiles, especially the snakes, will likewise be treated of: Some of the insect tribe are of peculiar interest, and worthy of the Naturalist's regard and paying attention; and therefore they will of course come to hold a place in the Work.

At the same time that objects thus connected with the different branches of Zoology will be treated of, some share of attention will also be given to objects connected with the important, and not less interesting science of Botany—the History of these plants in particular, to which medical virtues are ascribed by the native Indians, and to some of which they attach extraordinary necromantic virtues.

The plates will delineate some objects treated of throughout the Work, and be executed with accuracy by an artist of the first eminence at Edinburgh. In this way

the volume thus purposed to be published, is intended to have its pages occupied and filled up.

The Work is particularly recommended to the attention of the Ladies. They are the fairest and most benign part of the creation ; they impart the first instructions to the youthful mind, and therefore ought to have their mind and understanding replete with every species of useful knowledge ; and they possess, in general, more leisure moments to prosecute the now fashionable studies of Natural History and Botany than the other sex, who are too much engrossed by business abroad to allow their time to be otherwise diverted than that in which their minds never fail to be engaged. "*O cives, cives, quærenda pecunia primum est.*"

Save for the stilted verbosity of this notice there is not much to criticise, but some one evidently thought it a fit subject for a jest, as may be seen from the following, which was inserted in the next issue of the same paper (June 12th) :—

"In the press, and speedily will be published, the Keekarra Kaakarra or Wonders of the Woods ; compiled during last and part of the present Century by DUGALD DALGETTY, Esquire, of the Marischal College, Aberdeen."

These Serpents, hideous to the minds of men,  
That crawl and fatten in the sedgy fen ;  
Each prowling Tiger that infests the glade,  
And scowling crouches in his ambuscade ;  
The Fowls of air—and Finny tribes of sea—  
Each lowly Shrub, and ev'ry towering Tree  
Portray'd, to nature, in my fertile page  
Shall stand the wonder of each coming age ;—  
Delight the wise—the ignorant inform—  
And more than mortal make this Mortal Worm !

P. P. S. S.

The above Work, which is the result of much fatiguing research and travel through the impenetrable forests and inaccessible wilds of Guiana, will be put forth in numbers, in order to gratify the unusual anxiety of the public.

The first number will contain an interesting and accurate account of the GREAT SNAKE that was seen in this country in the year 1790, and whose track from N. to S. now forms the bed of that immense inland River which unites the waters of the Amazon, Essequibo and Orinoco. This number also treats of the Crocodiles that inhabit the banks of the Apur —one of which, in the year 1803, swallowed a large Canoe with several Indians in it; and further shews, that the best way of preventing similar accidents to one's self, is to stay at home and read other people's accounts of them. There is also an explanation of the most successful method yet discovered, of catching that beautiful production of nature, the humming bird; which it appears, may be done without any injury whatever to the plumage, by simply laying a little fine salt upon its tail.

N.B.—Wanted—Two active, smart-fingered Lads as Apprentices to the *Fly-catching* business."

It does not appear that Dr. FRASER'S "Enchiridium" was ever published; perhaps it was killed by ridicule, which is a pity, for it probably would have been useful to the Naturalist. Under the heading of "A New Work" a notice in the *Chronicle* of June 24th 1822, runs as follows:—

"There is now in forwardness for the Press, a new Periodical Work, to be entitled *The Raleighan Weekly Miscellany*, the Editor of which has been a frequent correspondent in the *Guiana Chronicle*.



The first number will be issued on the 7th proximo, and the publication will be continued weekly, as long as the Work meets the expected encouragement.

The title of this *Miscellany* is selected in compliment to the Memory of that gallant, enterprising and accomplished English Knight, whose character and exploits adorn the history of his country, while his melancholy and undeserved fate has placed an indelible stain on its annals. This compliment is deemed appropriate from the evidence we possess, that in his ardent pursuit of Discovery for the Advantage of the Nation which gave him birth, he made a long visit to THESE shores, enduring hardships of which we can at this time scarcely form a correct idea, and at the period when he could derive little benefit from that hospitality which then was, and yet continues to be one of the characteristics of the land.

It is the view of the Editor to endeavour to combine the Utile with the Dulce and to make his *Miscellany* at once the medium of instruction and amusement to its readers. For the attainment of these objects, such abilities as he may possess will be exerted to the utmost; and although almost unaided in the commencement of his career, he trusts that, with the encouragement of a candid and liberal public, he shall be able to continue his Work, until it shall have excited among men of acknowledged talents and ability (who are by no means scarce in these colonies) more of that attention to the welfare of the community of which they are members, than has hitherto appeared, and have induced them to devote a small portion of their leisure hours to productions by which the great object of the public good may be effectually promoted.

At its commencement *The Raleighan Weekly Miscellany* will contain about twenty-four pages octavo. Each number will comprise one original Essay on our Local or Colonial Politics, and another on Subjects of Agriculture in its more extensive sense, embracing all that is termed Rural Economy. It is also the intention of the Editor to have a Law Report (when he can procure the necessary aid) in which every contested case before the Court of Justice will be briefly noticed, and those which tend to the development of legal principles—and the extension of legal knowledge—will be more diffusely detailed.

*The Miscellany* will also be made the repository of such fugitive pieces in the Colonial newspapers as may appear worthy of being preserved, that they may be more easily referred to in a small pamphlet than when buried under the lumber of advertisements, foreign news, &c. The remainder of the Work will be composed of selections from other publications, especially such as may appear most adapted to the circumstances of these Colonies, with remarks thereon; and it is confidently expected that the collection will be enriched by the contributions of correspondents, when it is fairly afloat.

The Editor thinks it necessary to declare, that no person has any concern or joint interest with him in the projected Work. *The Miscellany* will be published at his sole risk and expense, and sold for his exclusive benefit. Subscriptions will be opened at the places under-mentioned, for no other purpose than that of regulating the extent of the impression; for the Work must support itself, and stand or fall on its own merits and the favour it gains with the public. No Subscriber,

therefore, will be held engaged to take the second or any other subsequent number, if the preceding one falls short of his just expectations. On the other hand, as the Editor never learned book-keeping, and truly has not the least talent or taste for accounts, he expects that his readers will send the price of each number, Fifteen Stivers (a quarter of a dollar) with their messengers for the papers—which will be deposited for sale at convenient places, to be hereafter pointed out.

The first number will further develope the plan of the different branches of the Work, and will also contain as much of the *Life and Opinions* of the Editor as he deems it necessary to communicate to his readers at the commencement of their acquaintance and by way of introduction.

Subscriptions will be received at the Store of Messrs. CHAMBERS and PATTERSON, Druggists, in Cumingsburg; at the *Guiana Chronicle* Office, and at some place in Mahaica Village, to be appointed by JAMES SHANKS, Esq."

Although a later advertisement invited Subscribers for the quarter and gave a list of other places where their names would be received, announcing No. 1 for the 7th July, it does not appear that this number was published.

There are two other literary advertisements in the same volume which are at least curious, the first, probably a "skit," being as follows:—

"*In a few days will be published, A RECENT CORRESPONDENCE between those late Literary Champions the ROUGH AND PLAIN PLANTER, with copious Notes, which contain Anecdotes respecting the copper-nosed Captain, and other Worthies.*—From the known ability of the parties, the public may expect something curious and entertaining at least,

*' When Greek fights Greek, then comes the tug of war.'*  
10th June, 1822."

The second is doubtful, but Mr. JOHNSTONE was well-known in connection with the deposition of President ROUGH :—

*" Speedily will be published, Addressed to Earl BATHURST, His Majesty's Secretary of State for the Colonies, by the Honourable ANDREW COCHRANE JOHNSTONE ; An Account of the Use, Progress and Result of a New Law called RUBRIC LAW ; introduced into this Colony under the auspices of the late Recorder of Hull, for the benefit of Proprietors of Estates, by which they are saved the trouble, not only of managing, but even of possessing them, by the simple and easy mode of first placing them in Custodia Regis ; secondly, of appointing Sequestrators, and thirdly of bringing them to Marshal's sale.*

*" What tho' his name stood Rubrick on the Walls !"*

On the 26th of June 1834, WILLIAM YOUNG PLAYTER, " Lecturer on Light," informed the public through the *Royal Gazette* that his work "The Horn Book, of the Lights that are in the Firmament for Signs to give Light upon the Earth ; being the Holy Bible, interpreted by its own Divine Light, and yielding Refreshing Doctrine," was ready for the press and waiting for subscriptions. This had been announced in May as treating of the new light in the Seventy Ancient Galileans, and the Elders and Office-Bearers of the Wisdom of the Holy Gospel ; the origin and meaning of Signs, Hieroglyphics, Letters, Numbers, and analogies between ancient Mythologies, Esop's fables and the Bible." A correspondent in the *Royal Gazette* spoke favourably of the work, but the

Editor of the *Courier* said he was reluctant to attribute wrong motives to the author, but could only suppose it to be the offspring of mental aberration ; whatever the cause, however, the effect was, he said, so pernicious that " we cannot allow mistaken liberality, or ill-applied courtesy, to restrain us from expressing our unqualified contempt for the new doctrine."

It appears as if two parts out of seven were printed and on sale at eight guilders each ; the contents of these were enumerated, but whether the work was ever finished is doubtful. Mr. PLAYTER died on the 22nd of April, 1837, and in the *Gazette* of the 27th is a long obituary notice of his career.

A relation of this visionary, Mr. J. L. C. PLAYTER, advertised on the 9th of March 1837, " Letters to Proprietors and to the Commercial Interest," for sale at one guilder, which from the verbose notice appears to have been at least curious. He says his system was " calculated to wholly prevent the vagrancy, and to promote the industry of the Agricultural Labourers of a low Country, *by affording them a greater reward easier got by staying quietly AT HOME to produce from Mother earth—and capable of yielding the direct way to encourage, and to substitute Commercial people instead of them, to take the chief carriage of the Country upon themselves, throughout the various channels of trade—which are (but with petty exceptions) at present wholly in the hands of the Agriculturalists, encouraging the increase of vagrancy of our Labourers, while it on the other hand, prohibits the rapidly increasing Population of Georgetown from engaging themselves at such employment—properly theirs, causing more vagrancy and vice*

among the lower class of the Commercial Inhabitants too, than might otherwise be the case—*were the honest and industrious emancipated from Idleness*, in their pitiable stations on all the Roads around the town.”

Mr. M. J. RETEMEYER offered, in 1837, a prize of 110 guilders for a short treatise on the observance of Sunday, for general use and more especially for the labouring classes. Among other things it was to contain a warning against attending the Sunday Market, what Managers, Masters and Mistresses and Labourers might do to promote this end, and how works of necessity could be done. Three essays were received, but not one of them was thought worthy of the prize.

In the *Guiana Chronicle* of Jan. 17th, 1840, is an advertisement occupying a column and a half, which opens as follows :—

“The Subscriber is desirous of Publishing, in the Newspapers, a SERIES OF LETTERS that he has written on subjects which are enumerated in a subjoined list, which he is positive will be of the greatest possible benefit, not only to the British Government, but to the rising generation, and to the rational and legitimate liberty of mankind in general. He is, therefore, under the urgent necessity of applying to the liberal feeling of a generous community, craving their assistance by a yearly Subscription of Six Dollars for each Subscriber, that, with what may be subscribed, he might be enabled to pay the Printers.”

The “Subscriber” was H. W. WELLS, the Swedenborgian, a well-known character, who every now and again managed to get a letter inserted in one of the papers. His list of subjects shews that the letters were

to be somewhat of the type of Mr. PLAYTER's lectures; we give one example :—

“ 10. Shewing the nature and quality of the NEW CHURCH that is to be established in the first instance by the British Government; thus by the Lord's over-ruling providence, and shewing the surpassing excellence of the doctrine of that crown of all churches. This church is already established by an august Private Society in Great Britain.”

Mr. WELLS could not have got sufficient promises for his first idea, for on the 8th of July following he informed the “ West Indian Public” that he expected, by the help of his Christian friends in Great Britain and upon the Continent, to receive a printing press, with which he would be enabled to bring out a paper :—

“ The FOUNDATION of the Paper, which is to be called *The Christian Reformer and West India Free Press*, is intended, without evasion or mental reservation, to be INTRINSIC IMPARTIALITY :—that is, its columns will be open to all parties and every individual of a party, and in no way influenced by any man or any set of men, and only to be governed and guided by truth and universal justice towards all parties.

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The *Christian Reformer* therefore,—rising like a Sun in the strength and light of truth and universal justice, and rendering transparent, from free discussion, the clouds of prejudice and of dark ignorance and error which veil the brightness of his rays,—will be open to all denominations of Christians, except the ARIAN and UNITARIAN, who indeed,—as blasphemously denying the Supreme Deity or Supreme Divinity of the Lord Jesus

Christ,—are not Christians, and certainly not the disciples of the Lord, our Saviour.”

In January 1841, Dr. JOHN HANCOCK, who had travelled in the interior for many years, announced a work entitled “British Guiana; including a journey into the interior to the Parime and El Dorado, and to the Carib Chief Mahanawa” in one volume 8vo. with map, price 15/. This would, no doubt, have been a useful publication, but probably, on account of SCHOMBURGK’S works being sufficient for colonial readers it gained no support. Several manuscripts now in the possession of the Government go to prove that Mr. HILHOUSE also projected two or three works on the Colony which were never published.

In 1854, the R. A. & C. Society commenced the publication of a Magazine, of which the following was the advertisement:—

“Prospectus of a Periodical Publication to be called the *British Guiana Journal*, of useful information in Literature, Science and the Arts.”

The attempts which have from time to time been made in various parts of that section of the Colonial Possessions of the British Empire to which we belong, with the object of establishing periodical Publications of a scientific and literary character, have so commonly resulted in failure, that it may appear presumptuous to appeal to the judgment of the community on behalf of any similar undertaking.

Yet it cannot be denied that the present time seems not inopportune for such an experiment.

It is believed that the class of readers in the Colony is much more numerous than is commonly supposed, although, for the most part, the matters which occupy



their attention are embraced rather under the popular definition of "News" than connected with the progress of social improvement.

It is known that there is within the Colony itself no lack of literary and scientific talent, which, at present, it may be said, if not lying absolutely dormant, is at least producing no adequate amount of beneficial influence.

There never was a time when ample stores of knowledge, in regard to the practical aims and pursuits of human society, were more carefully gathered or more liberally diffused throughout the highly civilized states of both the old and new worlds than they now are.

We are ourselves engaged in the prosecution of an attempt to rouse into active and healthy exercise the talent, intelligence and energies of our people; and nothing would seem to be more natural and appropriate than to convey to them, through the medium of a periodical publication, that counsel and encouragement which are to be derived from familiarity with the labours, both intellectual and experimental, of others, but which, under existing circumstances, can reach them but imperfectly if at all.

It is proposed then, with the sanction and under the auspices of the Executive Committee of the Exhibitions' and Museum Fund, to publish, at intervals, a Journal or Repertory of instructive papers, whether original or obtained from other sources, which, without being strictly limited to any particular branch of literature or science, shall keep especially in view the purposes for which the Exhibition and Museum Fund has been organised.

In these Colonies, meetings of agriculturists or of manufacturers, such as are usual in the Mother Country, at

which they have the opportunity of making known and interchanging the fruits of their respective experiences, are difficult if not impracticable; but there would be nothing to prevent any such person communicating through the pages of this Journal, matter which, in his judgment, might be worthy of further investigation or discussion; thus leading to the diffusion of more accurate information, or possibly, to important discovery.

While it may be advisable to explain that political and theological subjects must necessarily be excluded from the pages of this Journal, it is desirable to state that there will be no hesitation in treating of measures affecting general education or the sanitary condition of the people. Nor, eventually, should the Journal be likely to become permanently established in public estimation, would it be difficult to give to it, to some extent, a lighter character than that immediately contemplated, and thus to make it acceptable to a wider circle of readers. Without entering further into detail, however, enough has perhaps been indicated, to shew that it entirely rests with the community to decide the peculiar character as well as the fate of the proposed attempt.

It is hoped, therefore, that all who feel an interest in the advancement of this colony, and who are desirous of promoting, not merely its material but its moral progress, will co-operate in the trial of this experiment; and that *all*, who are in a position to do so, will assist its conductors, not merely by becoming subscribers, but by their communications and suggestions, and by their personal influence.

As pecuniary profit is no part of the object of the promoters of this scheme, so also they do not feel called

upon to incur any pecuniary risk on its account, and the work, therefore, will not be issued unless the names of at least One Hundred Subscribers are received.

In order to place it within the reach of persons of moderate means, the price of Subscription is at present fixed at the rate of 24 cents a number.

The Journal will be printed in 8vo., each number extending to 24 pages.

Names of intending Subscribers, and Communications will be received by the Secretaries to the Exhibitions' Committee at the Rooms of the Royal Agricultural and Commercial Society in Georgetown.

W. WALKER,

Chairman of the Executive Committee  
of the Exhibitions' and Museum Fund.

2nd June, 1854.

The first number was issued on the 1st of August, and contained papers on Museums, Fibres, and Gum Arabic, besides Meteorological observations and notes and queries. It was noticed favourably in the *Royal Gazette*, the reviewer saying that "there will, certainly, be little patriotism in the community if this attempt is not liberally encouraged." The second part, which came out over three months later (Novr. 25), dealt with the importance of manures, and the effect of the Russian war on the development of colonial fibres, besides other matters. Whether any further issues were put forth is doubtful, and, taken altogether, we think it may be considered as one of the abortive publications. As the Society has no copies of either number it would be desirable, if any exist, that they be procured. We may mention that one of the Secretaries to the Committee

referred to, at that time, was GEORGE DENNIS, Inspector of Schools and author of "Cities and Cemeteries of Etruria."

The last abortive publication to be mentioned is one that would have been very useful if we can judge from the author's other work, "Unter den Tropen." No doubt his English would have been revised by some competent person and the result exceedingly valuable. But, unfortunately, Mr. APPUN died a few months after the advertisement appeared, and no one appears to have attempted to carry out the project, although his diary and notes must have been taken over by Mr. BARSCHALL, his executor. The notice appeared in the *Colonist* of February 15th, 1872, and following days, the editor, in calling attention to it, remarking that Mr. APPUN had had abundant opportunities of studying both the Zoology and Flora of the country :—

"Natural History of British Guiana by CHARLES FERDINAND APPUN, Zoologie and Botaniki, with plentiful splendid illustrations, in 3 or 4 vols.

This work, written with the elaborate diligence, shall give a true living picture of the animal inhabitants of this colony. The greatest care will be taken to make it equal to the best works of this science, and shall be not alone a scientific, yet a very amusing work for every class of people.

The Author will also publish therein his own observations in this science made during his stay on the Coast, on the rivers and upon the mountains and savannahs of the far interior of this colony, mixed with the observations in the same matter of WATERTON, SCHOMBURGK, HILLHOUSE, etc., while for the scientific part of this

work some of the eminentest naturalists of Germany have promised their assistance.

The Illustrations will be made in the truest and most beautiful manner, after living or the best natural stuffed Animals of the Museums of Berlin and Stuttgart, the first in the way of photographic, or painted by the author himself, the latter by the excellent painters of animals, Messrs. SPECHT and MEYERHEIM, at Germany.

The same is to be said about the Plants, for which the author himself will paint the Illustrations, chiefly those of Palms, Ferns and Orchids of this colony.

The Work will be given out in series of six sheets text and six leaves of illustrations each one.

Also will be published by the same author a small compendium of this work for the use of schools in this colony."

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## *Agriculture in 1829.—II.*

*By William Hilhouse.*

(Further extracts from the MS. referred to on page 28, *ante*.)



AGRICULTURE—Such has been the bounty of nature to these regions, that the science of Agriculture, in comparison with its European improvement, is still in its infancy. Little more is required than to plant in the rainy, and to reap in the dry season, and the Earth gives her increase without manure, the plow or harrow. It is true that the whole labour of the field is performed by manual exertion, but when it is understood that this labour, in the only instances where machinery could be substituted, is only required every 10 or 15 years, no machine would pay its expenses. A sugar estate once drained and properly planted for 12 or 15 years, requires absolutely no other field labour than that of weeding and clearing the drains, reaping and re-planting the sugar.

It is the general custom when lands have been so long in cultivation as no longer to answer the expectations of the Planter, to abandon them altogether and leave them fallow for several years in the meantime clearing away virgin forest lands, the produce of which is so great and immediate as to pay the expense in one year, and does away entirely with the necessity of manuring the old lands. It is plain this system cannot last for ever, as notwithstanding the great abundance of land in most parts of the colony, the diffused and extended nature of

the cultivation will in time cause as great a diversion of labour as the practice of manuring itself would. Ploughs have been from time to time imported and have been found to answer in turning uplands that have been long cultivated, but after the first essay, no further occasion has been found for their use, till they were rotten. At this moment a cart is an extraordinary machine in the country, and a horse or mule with a pack-saddle is nowhere to be seen. Indeed so much has the colony availed itself of its advantages for navigation that every estate by its navigable canal, and the use of boats, renders unnecessary the ordinary implement of land carriage. To explain these circumstances it will be necessary to add, that all estates except those in the rivers, begin at the sea coast and run between parallel lines, to unlimited distances in the interior.

The coast lands also, for some miles inland, are from one extremity to the other of the colony uniformly level, and when this level terminates the soil is found unfit for cultivation; navigation therefore meets with no impediment and the Planter has always a resource in the forest behind him. The following remarks may not be free from error from the want of more general discussion; they are principally compiled from personal observations.

A sugar estate of 300 negroes with all the works and proper extent of cultivation will be worth £60,000 at the present valuation. It will produce from 500 to 600 hhds. with proper management. This crop worth from £7,500 to £9,000 is, including interest, 8 or 10 years' purchase. But it is seldom an estate can be bought with all these preliminary advantages, so that 12 or 15 years may not be an unreasonable time allowed to clear the capital.

A Coffee estate of the same strength, worth about £45,000, may make 100,000lbs. of Coffee annually, or about £5,000, but the crops being very uncertain Coffee estates are generally longer in clearing themselves than Sugar properties.

Cotton, in the earlier period of the colony, when the front salt lands were new and the plant gave a great comparative return, was for the first 10 years a very lucrative cultivation, requiring little expense beyond the first purchase of the negroes, and those negroes bought at  $\frac{1}{3}$  the present price. In the present day however with the value of the article so much reduced, and those parts of the soil most favorable for its growth exhausted, the purchaser of a cotton Estate involves himself in certain ruin. However desirable the abolition of the slave trade might have been on the score of humanity, it entails upon the mother country the certainty of losing the command of one of the principal staples of her manufacture. And for the future she will be dependant on America or other States for a supply of that article which it would ruin her own colonists to cultivate; the British Government can never keep a cotton colony in its possession till it reduces the price of negroes to something less than £100 a head, as under present circumstances it would otherwise never pay its expenses.

There is no country within the tropics so favorable for grazing as this. The immense savannahs and waste or deserted lands preserve a constant supply of the finest herbage for cattle, particularly oxen. The beef and mutton, though not so fat, are equal in flavour to the best European. And the rapidity with which cattle increase when the least attention is paid to them, proves



the superior congeniality of food and climate. There is no doubt that by proper establishments the whole of the British Navy on the West India Station might be supplied with a better and cheaper description of dried or smoked beef than from any other part of the continent or islands. The Port of Demerara ought indeed to be the Grand Dépôt for provisions and fuel for the Navy in these seas. It moreover enumerates more than 50 different kinds of hardwood of the most superior quality, of which several, for size and durability, are the best calculated for the construction and repairs of Ships of War, as a proof of which the strength and durability of the different species of colony craft may serve as a specimen.

It is extraordinary, that with all these advantages of local circumstances, the Mother Country has never yet suspected that she was in possession of a colony, that under every circumstance would enable her to keep her Navy without intermission on a West India Station. The French and Dutch have been long aware of this, but the former have kept the knowledge to themselves from

\* and the latter when possessors, from that cautious system, that prevented them from showing all its advantages lest they might tempt the aggression of stronger powers. Accordingly, from the first we have little more information than what relates to botany, birds and butterflies, and from the latter nothing but accounts of agues, fevers and bush negroes. The English themselves have been so long exclusively occupied with their mercantile concerns, that after a possession of nearly 20 years, the legislature at home, or many of them, still call

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\* Omission in MS.

it, with Mr. POTT, the Island of Demerary, and the best informed on other subjects are still in the dark on the subject of the richest, the most extensive, and most advantageously situated of all the British West India Colonies, the key of the Continent of South America, and the centre from which all communication with the Spanish and Portuguese Kingdoms of the South must hereafter emanate.

#### PROPRIETORS OF ESTATES.

Before entering upon this subject, it will be necessary to premise, that it will be impossible to convey a proper idea of the real and true meaning of the term proprietor, without giving some offence to the feelings of those who on the side of the Planters have not considered the nature of their tenure, or of the Merchants who do not wish the nature of that tenure to be generally understood. Such offence however must vanish before the conviction that a simple view of the facts must convey.

A colonist who has scraped together a capital of £5,000, does not conceive that the interest of that sum will enable him to live in the style suited to his ideas of a West India fortune. He looks forward to a lapse of 8 or 10 years more when he could retire with a sum of £40,000 or £50,000, and upon that could manage to enjoy the privileges of European gentility. Accordingly he negotiates with a merchant who advances the balance between the sum he has in hand, and the instalments due on an Estate of £50,000 value. For this advance, the merchant receives interest at 6 per cent. and the consignments of all the produce of the Estate till the whole debt is paid; perhaps for a year or two after, as terms may run. At any intermediate time the merchant claims

the power of foreclosing the mortgage which he has upon the Estate, and the Planter binds himself in willing condemnation on the law proceedings for that purpose.

The £5,000 of the Planter being sunk in the Estate, the merchant, the 1st year, possesses security for at least that sum more than the first value—and every succeeding year increases the security by the receipt of the crops and the diminution of the debt, whilst in all the subsequent decreasing terms of the debt his great source of emolument, the consignments, has no diminution. It is apparent therefore from this statement that a Planter buying an Estate with a mortgage to a Merchant, merely gives that Merchant a premium down, to appoint him his Bailiff or Agent, on a Property that may in a given number of years restore to the Merchant his own capital, trebled by interest and consignments. At the expiration of that time the Estate becoming free, the *Proprietor*, now also rich, returns to Europe to enjoy his boarding house at Cheltenham, or his wheel-chair at Bath. And let those who envy the possessors of West India fortunes, point out in this how the proprietor of £50,000 is superior to him of £5,000—since the anxiety, the care, and the contumely of the rich proprietor, during the period of his occupancy, has merely entailed upon him the diseases of age, and taken away the power of enjoyment.

It is evidently not the interest of the Merchant to encourage the liquidation of his debt speedily, provided he sees that the Property does not diminish in value below his security. It is common therefore for the Planter to procure such pecuniary advances from the Merchant as may continue the period of consignment, and give the Proprietor means of entering into all the extravagances

of a trip to Europe, a tour to the Continent, etc. When the Merchant thinks the holiday time is over, he shuts his purse strings, and sends the Planter back to his Estate with a flea in his ear. The Planter returns from Turtle, Turbot and Venison, to his dry Salt Fish and Plantains, curses the Merchant for illiberality, lives as well as he can to console his spirits under the wretched alternative, and becomes again the Bailiff of the Estate. *Esto Perpetua.*

The Attorney of a Property is a person left in charge by the Proprietor during his absence from the Colony, and who is responsible for the proper conducting of the concern during such absence. The customary allowance for this duty is 10 per cent. But, with long established and extensive properties, where the revenue is very considerable and the duty of the Attorney easy, a less sum is mutually agreed upon. The Attorney transacts the mercantile business of the Estate, he superintends the supply of provisions, and clothing, the erection of buildings, and all ordinary and extraordinary expenses. He in fact combines the duties of the Proprietor and his Town Agent. And his principal cares are to regulate the expenses of the Estate in proportion to its income, to provide it with a proper and efficient manager, and to see that the produce gets to a good market.

An Attorney should, if possible, give over an Estate in the same (or a better) condition as that in which he received it. With regard to the number of negroes, this, from the pressure of a severe sickly season, will frequently be impossible. But it will be very easy to shew that proper attention has been paid to the comforts of the negroes, and to their proper medical attendance.

Keeping the buildings and works in a good state of repair is a duty of equal weight, and these duties will require the presence of the Attorney upon the property often enough to give him a proper idea of the manner in which the Manager discharges his duty, both with regard to cultivation and care of the negroes. It seldom happens that one man combines the requisite qualifications for both an Attorney and Manager, any more than of Proprietor and Manager, and as it is of most consequence to have a person in charge of the estate of an Absentee whose pursuits enable him to do the legal and mercantile business in the Capital, the Attorneyship and Management are most generally discharged by different persons.

#### MANAGEMENT OF ESTATES.

The Manager proceeds to the Hospital to see how the sick fare, whether their medicines have had the desired effect, and also to receive complaints and new patients. When the doctor attends early, which is much to be desired, the Manager accompanies him in his visits to the sick, explains to him the characters and habits of the different cases, and receives his instructions, all cases and prescriptions being at the same time regularly noted in a journal kept for that purpose. It frequently happens that many present themselves for admission who have no visible ailment, and who in a Hospital of whites would be refused. But with negroes we must be more tender; a day of rest, or a dose of salts, acting more upon the idea than the body of the negro, frequently prevents a serious fit of sickness. The Manager, by his attendance on the Doctor, soon acquires a practical experience of the common effect of different remedies, and his acquaintance with the disposition of the negro, his prejudices and pre-

possessions, renders him a most useful assistant, and gives him the power of superintending the duties of the sick nurse effectually. The Manager or a trusty Overseer administers and mixes the Prescriptions of the Doctor during his absence. A disagreeable duty then occurs, the dressing of the sores, which from the dirty and careless habits of negroes, are of a nature and frequency unknown amongst Europeans.

He then inspects the works and building, and in the different departments of the manufacture of sugar, rum, drying or cleaning coffee, or preparing cotton for the market, his utmost attention is required to the state of the weather, the quality of the fuel, the cleanliness of the Boiling House, and the attendance of the overseers and their negroes to their duties about the buildings. He then proceeds to the fields to see that his canes are properly cut, weeded and supplied, his fields well-drained, his plantains in good order, all fallen ones cut close to the stool, and his watchman on the alert, coffee and cotton clean and trimmed, and no water sprouts draining the sap of the tree from the green coffee. He receives the reports of defaulters from the different gangs, compares them with the entries in the Hospital, and punishes, either on the spot or next morning, those delinquents who have been found missing at their proper hours of duty.

A casual absence is punished by at the most half a dozen lashes, but as absentees are generally habitual defaulters it becomes often necessary to be more severe. And here a few observations are necessary that may tend to correct the prejudice amongst Europeans, of believing that corporal punishment is amongst negroes inflicted to excess. I make the assertion, and every man of candour

will support it, that in hardly any known instance of crime is the punishment inflicted upon the negro one-half or one-third so severe as what would, in a similar offence, be inflicted on the white delinquent. It has been the writer's lot to witness, in numberless instances, both in the execution of the civil and military laws of the Mother Country, corporal punishment commonly inflicted so severely, as to confine the offender for many weeks afterwards in a Hospital, under the strict charge of a Surgeon. On an estate punishments are never inflicted to such an extent as to prevent the negro from returning to his work immediately after. The law allows no more than 25 lashes to be given by the Master at any one time for any offence, and the interests of the Master seconds the laws. It is only in cases of notorious delinquency, when the Magistrate is called to punish publicly and officially, that punishments can ever be said to be severe. But even then they are far below the scale of European infliction. The law may in some instances be broken, but when it is considered that the Manager who breaks the law is at the mercy of every discharged Overseer who may choose to inform against him, excessive punishment is a measure of serious risk, and is in fact rarely known to be practiced. It is the case with every gang of negroes, as with regiments in an army or crews of ships, that the punishments are the monopoly of a certain number of notorious delinquents, whose want of conduct and character is perpetually leading them into crimes and concomitant chastisement. Four or five desperate characters of this kind will keep an estate of 300 negroes in the perpetual necessity of corporal punishment. It is therefore most unjust to say, that because these few are marked with

the whip like an English deserter, that they have a hard or a cruel Master ; and more especially when a further examination would show, that with the rest of the gang, scarce the mark of a lash is seen. The law of punishments is in fact too lenient, since it incapacitates the master from punishing serious offences as they deserve, and with desperate offenders has no effect ; it should be extended to 50 lashes, but with this Ordinance, always to be administered before the gang, in the presence of the medical attendant and all the white servants of the estate ; this exhibition is a more complete check upon wanton tyranny than any law could be, and with the negro, would have a much greater effect than the mere pain of punishment. It would obviate the inconvenience of constant applications to the Magistrates, and without doubt, would considerably decrease the number of punishments. Indeed, it is much to be wished that the custom of punishing before the whole gang, in the manner of a court-martial, was in general use, as there is no doubt of its superior efficiency over the common method of infliction, and the shame attending the exposure would operate equally with the punishment.

One of the most serious duties of management is attention to the Creole Gang of the estate. The negro parents, though not generally deficient in affection to their offspring, yet are always lamentably so in those habits of cleanliness and wholesome nurture without which it is impossible to raise their infant progeny. The manager must descend to the most minute particulars of the cares of the Nursery. And he will find his greatest stock of patience put to the trial by the filthiness, obstinacy, neglect and stupidity of the negro mothers.



Generally speaking, the creoles of an estate are raised more by the attention of the whites than of their own parents, and the most constant and unwearied attention is necessary to prevent the most pernicious practices of the mothers, even on the persons of their own infants, inoculation for Yaws or Leprosy, creating sores, and other disgusting tricks, being practised by the women in order that they may be excused from their daily labour to attend the child. There is scarcely an instance where gangs have increased or kept up their numbers, however favorably constituted, without the intervention of rewards to the parents for raising their offspring, united to the extraordinary cares of a humane Manager. Every day must he see the creoles drawn up under the care of their proper nurses—with clean skins, and feet free from chigoes. A mess must be regularly made for them exclusively, of nutritious diet. They must by no means be allowed to ramble about the negro yard, but must be kept in a separate building or creole house, within a very short distance of the Manager's dwelling, so as to be constantly under his eye. At proper seasons they must be physicked as they require it, to destroy the intestinal worms, with which they are most peculiarly infested. And the Kitchen Offal should be distributed to them with a generous hand. Those from 5 to 10 years of age should be collected into a small working gang, for trifling jobs, that they may acquire habits of industry, but should by no means be employed beyond the bounds of what might be deemed wholesome exercise. With these precautions there is some chance of keeping up the numbers of an Estate, which is otherwise impossible.

The apportioning of the labour to the strength of the

gang in general is another point of essential consequence, and the standard by which to begin is to require from the able negro, one-third or at the very utmost one-half of the labour that would in the same time be performed by an able European labourer. With this proportion, an estate of 200 negroes, being a fair gang, should make 400 hhds. of Sugar or 200,000lbs. of coffee, or 180,000lbs. of cotton, supposing the soil to be good, the works adequate, and the cultivation of proper extent. But sugar is the only cultivation upon which this return can be expected.

#### NEGROES.

There is no subject upon which so much difference and error of opinion subsists as the description of the negro character.

On one extreme old Spanish colonial writers have laboured to prove them inferior in intellect, and designed by Providence to show the lowest state of degradation in humanity. In opposition to this, *Les Amis de Noirs* wish to exalt them above all examples of civilized Society and to endow them with a greater share of instinctive abilities and natural virtues than the most favoured of Europeans. Between such ridiculous assumptions, the truth may be easily discovered by the simple test of those principles that constitute the superiority of science and civilization over ignorance and barbarism—that exalt the Union of Society over the feuds of individual interest.

In Africa, a number of petty tribes and Governments, formed upon the first rude principles of individual ascendancy, with laws scarce more than sufficient to make the authority of the despot acknowledged amongst his

subjects, forbids at once the introduction of Science, and leaves each individual to depend upon the strength of his natural talents and the might of his own arm for subsistence. Establishments are destroyed as fast as they are erected, and the petty jealousies of a thousand despots keep alive in Africa the flames of war, desolation and slavery. Under such circumstances what must be the character of the negro; what even would the white man's probably be?

Barbarism in all countries and in all ages, gives the same picture of despotism amongst individuals who rule, and slavery amongst those who are governed. The character of the Celt, the Hun, the Goth and the Vandal, in the extreme Era of their ignorance and barbarism, is at this day, with allowance for the influence of climate, the character of the negro. It implies no extraordinary debasement of nature to account for the blemishes that appear at first sight so monstrous. The negro is cunning, the barbarian of Europe is politick; the negro is revengeful, so is the Goth; the negro is a thief, so was ROB ROY; the negro is a liar, so are all those who do not discover in society the virtue of truth. The negro is indolent, so are all those who can procure the necessaries of life without labour and who have no ideal wants beside. The negro is obstinate, treacherous and ungrateful—lascivious, intemperate and inconstant—so has nature formed all mankind, till religion and reason reduces the selfishness of individual gratification to the standard of social expediency.

It is ridiculous, because we find in the negro natural vice operating uncontrolled, to mark him as a monster; we might, by a parity of reasoning, level the uneducated

of our own colour to the grade of beasts, and it is equally ridiculous to suppose that to the negro, whose only pleasures are the gratifications of his natural appetites, and whose only pains or cares arise from the mortifications or denial of those appetites, that the same arguments would avail as those we should use to an enlightened European. Ignorance and barbarism, in all nations and colours, are alike the parents of violence—tyranny on the one hand and slavery on the other—and till the impulse of nature is brought under subjection to the laws of society, and the strong hand of Government reduces the violence of the individual to the bounds of common justice, so long will the wiser be the masters and the ignorant be slaves, and so long will coercion be the only pledge of obedience, and all the vices we have enumerated be characteristic of the state of slavery.

The creole negroes of the West Indies owe their superiority over the Africans to their being bred up in society, with the laws constantly operating before their eyes, and they are the more content with their situation by seeing that those laws are to them a sure protection from violence, in fact they begin to have some idea of the policy of good behaviour as it operates on their general state of comfort, and they comprehend the use of that self-denial without which the African is either outrageous or melancholy. This is their dawning of political reason, and it would be highly dangerous to force the light upon them further than nature calculates them to bear it. To theorists it should therefore be said, time will accomplish all you wish, and the change will then, and ought to be, so gradual that the chain of society will still continue perfect, and need fear none of those

dreadful fractures, with which the party endeavours of misguided men have threatened it.

CREEKS.

Boerasiri Creek opens at the point of junction of the West Coast with the East Bank of Essequibo river. It is not navigable for schooners above  $1\frac{1}{2}$  miles from its mouth, and its source is scarcely 30 or 40 miles in the interior in the south-western savannahs.

The country about the rise of this creek is so plentifully endowed with the bounties of nature that it is astonishing it should never have been settled and cultivated. Fish, game, excellent soil, and picturesque scenery, have long made it the retreat of runaway negroes, without having as yet attracted the attention of white settlers.

It should be a point of policy to establish a strong Indian post at this point, which could be done with little trouble or expense, as the communication with Demerara and Essequibo is direct and simple, either by land or water.

COLONIZATION.

The Dutch who first settled the country proceeded some miles up the river before they established themselves, believing rightly enough that the sea shores, from being low and repeatedly overflowed, would be very unhealthy. In time, however, the interest of the planter overcame the love even of life, and as low lands were found to be infinitely more productive than those more inland and elevated, the scene of cultivation gradually changed. There is now hardly a vestige remaining of the old capitals and seats of Government of either Demerara or Essequibo, that formerly stood on Islands

nearly equally distant from the mouths of both rivers. Georgetown, the present capital, on the East Bank and at the entrance of the river, contained at the last census

\*White,                      \*Colored,                      \*Negroes,

\*Houses, and extends nearly two miles in length by about half a mile in breadth, the district called Cummingsburg being laid out in such a judicious manner as to be justly considered a model for towns in the West Indies. Till very lately the comparatively small number of adventures and the speculating liberality of the merchant in England gave the colonists such hopes of acquiring speedy independence that few ever thought of being compelled to make the colony their home. It was looked upon as the land of sojourn, and the comforts of life were scarcely ever thought of. The only relaxation and the only substitute for their comforts was an unrestrained indulgence in the pleasures of the table, and an exercise of such unbounded hospitality as contributed in no small degree to thin the ranks of society of its most ambitious and enterprising members. Of late years, however, a considerable alteration has taken place—capitals are confined. The merchants at home are less profuse, and the colonist finds that the labour of 6 or 7 years, instead of allowing him to keep a carriage in England, barely furnishes him with a few domestic negroes and the means of purchasing a dwelling whereby he may save the expense of house rent. In consequence of this limitation of prospects he becomes more economical, more temperate, and as he finds he must live longer than he calculated upon originally, to

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\* Omissions in MS.

make his fortune, he begins to study the comforts and conveniences that make life less precarious. The change is very rapidly effecting, and a few years will generate in the breast of the British settlers what has before been thought paradoxical, something like an attachment to the soil. When this takes place we may look forward to something like society and a public opinion, but where there is no permanent interest there is no public spirit, and accordingly we see that Demerara, compared with Barbados or Jamaica, has hitherto presented nothing but a selfish struggle of insignificant parties, and a total want of unanimity or understanding amongst all classes of the community. So well aware are the colonists of this feeling that if you ask one what is the reason of it he will tell you, "We are too busy cutting one another's throats to think of any thing that regards the interests of the community."

Some individuals have projected schemes for the colonization of the interior, which have never ripened into execution. It is beyond doubt that there are numerous situations at the heads of the different creeks, where good soil, high ground, salubrity of atmosphere, and great natural advantages would render a colony of whites particularly flourishing if they could be kept together. But the temptation to go to the Estates on the Coast, or to the Town, would, it is feared, operate too disadvantageous.

It is however a feasible measure, and if persevered in might be carried to such an extent as to secure to the British the undisturbed possession of these regions. The colonist for this purpose must be drawn from the class of poor labourers with families, and as few artizans as pos-

sible, for it is with these that all the disorders originate that render such plans futile.

On this subject a few words will be necessary concerning the granting of lands. It is well known, that with little labour, virgin land yields a great proportion of produce, whereas lands that have been long cultivated require double or treble the labour to give the same return. Notwithstanding this the British Government refuses to make grants of the new or forest lands for purposes of general cultivation, on the humane plea of not increasing the labour of the negro beyond his present proportion. The absurdity of this measure shows the folly of legislating in detail for the Colonies on the other side of the water, since it is evident that if a planter is obliged to send home 500 hhds. of sugar from an estate that has been long planted he must keep 500 acres of cane in cultivation. Whereas if he is allowed to cultivate new land, 250 acres will give the same return, by which the labour of his negroes is diminished one-half. The inhumanity of the restriction is evident, and where the quantity of fine land is so very over proportioned to the number of negroes it ought to be the policy of Government to give the greatest range of choice, and rather to encourage the removal of negroes from worn out estates, where the labour becomes every day more severe, to newer and richer portions of soil, where the labour for the same return is much less. The same train of argument applies to the stoppage of the importation of negroes from the W. I. Islands.

Most estates are mortgaged to certain Houses till such mortgage is paid, The original slave population being calculated more for immediate returns of labour, than for the



propagation and continuation of their numbers, are daily decreasing in efficiency and numerical strength. It follows therefore that during the liquidation of a heavy mortgage, the instalment of the latter years will be paid off by an accession of labour exacted from a decreasing gang. This there is no means of preventing, because the debt must be paid, and the Merchant cannot, from the exorbitant price of negroes in the colony, increase his loan by supplying the deficiencies. There is no doubt that the advantages of this colony over the Islands with regard to the food and comforts of the negroes, should, in point of mere humanity, direct the transmutation of the slave population from those of the islands that are barely fertile enough to support them. And the purest spirit of policy as well as philanthropy dictates at this time that we import new island negroes to plant new lands.

#### COFFEE.

The cultivation of coffee is simple and much in favor of the health and comfort of the negroes. It is generally planted in rows at 8 or 10 feet distance, with intermediate rows of plantains. The young coffee tree will not grow in these latitudes except shaded from the scorching rays of the meridian sun, and the broad leaf of the plantain or banana is found best calculated for this, whilst it ensures a constant supply of nutritious food for the gang employed in its cultivation. An acre of coffee of 700 trees will yield in average fair seasons \$300 of Coffee and often more. The plantains will also yield 400 bunches, making the whole produce worth near \$400 per annum. An able negro can with ease keep 3 or 4 acres of this cultivation in excellent order. It is not therefore without reason that the old Dutch colonists, who were

shrewd calculators, gave such a preference to the culture of coffee; the coffee of Demerary being known in Europe by the name of Dutch coffee bears a very high price in the market, considerably beyond that of the W. I. Islands, and only exceeded by the Turkish, from which it differs very little in quality. It blossoms in February, March and April, the fruit of which blossoms is ripe in August, September and November; a second blossoming in July, August, or September, makes what they call a first crop, which is picked in March, April, or May. When picked it is passed between a board and a wooden cylinder with perforated copper nailed round it, called a Pulping Mill. This separates the outward pulp of the coffee from the yellow husk which is afterwards washed in a cistern and spread upon an elevated pavement or droghery to dry. When dried perfectly hard and crisp, it is put into the stamping mill, which consists of a heavy wooden roller that is turned round in a circular trough of the nature of a Cyder Mill. This breaks off the dry husk of the berry, which is afterwards winnowed, sifted, and sorted into the different qualities of pearl first quality, second quality, and broken coffee, and is then fit for the market.

Coffee should be planted during the first four months of the year, in a young plantain walk, sufficiently advanced to shade the young trees. At 3 or 4 years growth the leading sprout should be broken off, so as to leave the tree  $4\frac{1}{2}$  or 5 feet high, when it is low enough for the negro to pick over hand without breaking the branches. The green upright shoots that spring from the sides of the main stem should be stripped off with the hand. The trees should be kept clear of weeds and

mistletoe, and all dead branches carefully removed. In fact the tree should be treated as an experienced gardener would treat a standard shrubby fruit tree in Europe, to expect its full proportion of fruit. In the curing of coffee great care should be taken that the fermentation or heating of the berry, prior to stamping, should not be excessive, otherwise the coffee will become black and unsaleable. The colour for the market being a greenish pearl colour—if the coffee in the husk be not slightly heated it will be too yellow, but if too much so it will be dark and of a musty smell.

The best flavoured coffee for use is the berry that dries upon the tree and does not pass through the pulping mill, but it is much more difficult to prepare than the other, nor would half the crop be picked if it was left till it arrived at this stage.

#### PLANTAINS.

The soil of this colony is peculiarly adapted for the growth of this plant, which requires a strong, rich clay. A plantain walk has frequently been known to produce, without re-planting, for 15 or 20 years. The facility it affords of feeding the negro population with the succedaneum they prefer to every other, even bread itself, and its amazing productiveness in this congenial soil, together, gave the colony an amazing advantage over the West India Islands, where it can only be grown partially and by no means equal to the supply of the population. By law, an acre of Plantains is required on all estates for every 5 negroes. But, for the first 10 years, an acre of good land will feed 10 negroes, with common care, that is, it will produce in 10 years 10,400 bunches, each bunch weighing 10 lbs. of edible vegetable bread,

in the whole 104,000 lbs. weight, with the simple care of weeding and draining.

It appears that, like the Papaya, there is a male and female plant, which is evident, from the internal substance of the fruit, where the appearance of seeds is evident, but they are all abortive from want of the impregnating principle of the male plant. It is only grown therefore from divisions of the stool or roots, and the rapidity with which it is propagated by this means renders any care about the seeds unnecessary. Indeed, no good purpose could be effected by the introduction of the male plant, as the fructification of the seeds would evidently detract from the farinaceous principle, and those who ate the fruit would have the trouble of extracting them, which in its present state is not required.\*

It possesses the nourishing principle in a greater degree than any other vegetable, combined with a slight astringency like that of new wheat flour. Men, horses, dogs, hogs and cattle thrive upon it. By cutting the green fruit into strips, and drying it in the sun, it may be pounded into a kind of flour called Congo Tea, from which soups, pap, and panada are made, most essentially useful in the hospital and the nursery. The broad leaf, when drooping and dried, is a good substitute for thatch. The fibres of the stem make excellent ropes. And the expressed liquor from the trunk is of so very astringent a quality, that it may be used with success for nut gall or oak bark.

The man who introduced the plantain deserves this praise, that he ensured to a population that has no wants

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\* Mr. H. is of course mistaken in his premise.—ED.

beyond the gratification of its natural appetites, the means of gratifying those appetites, with health, plenty and comfort. And he has thus relieved the planter from a source of increasing anxiety, by providing in one article of food the good qualities that twenty other varieties together could not substitute.

DRAINAGE.

This article embraces a wide field. Hardly an acre of cultivated land lies above the level of high water mark; the whole of the vast plain of cultivation being formed by the deposition of the mud that discolours the sea for some leagues from the shore at the time of high tide, and would be again covered, but for the construction of high dams, by which that is prevented. No country in this respect approaches nearer in resemblance to that of Holland, and none but Dutchmen would have thought of reducing such a mass of water into cultivated Terra Firma. To the glory and praise of the industry of that nation this has however been accomplished, and the rules and regulations adopted by the Government of the early settlers merit for their wisdom and public spirit the highest eulogium.

To the neglect of these precautions are owing many inconveniences under which the colony now suffers. But private interest has preserved in most instances what the Government has in many forgotten. Every improvement of consequence has been effected by Dutch or French Governors. The British have been better contented with pocketing their salaries in peace and quietness, and letting the colony stand by its own strength, which fortunately it has been able to do without their fostering assistance. It has been an excuse with them,

that the want of unanimity amongst the colonists prevented being carried into effect works of improvement, and indeed it has happened that a petition for a Canal has been followed in a few weeks by a petition against it, and both with the same signatures.

But this is not surprising. Individuals with their own interests in view are the worst judges of works of public utility, and it is the province of Governors and Governments to serve their country even against its will.

This principle with regard to public works is unimpeachable, for opposition dies with the experience of the benefit resulting,—and had it not been the principle of the earlier Governments, Demerara would still have been a waste of waters. It is said that before there were any public roads of consequence, a Field Piece with a Company of Artillery were sent from Stabroek to Mahaica, a distance of 25 miles, with orders to make free quarters on every estate till a road was made through it practicable for the Artillery. The road has been excellent ever since, and the French or Dutch Governor with whom this device originated has done more for the Colony than any succeeding British Governor has done after him.

What renders this sluggishness most unaccountable is, that there is at this moment a sum of money in the British Funds belonging to the colony, the simple interest of which would be adequate to the annual expenditure required for such public works as were necessary without any additional taxation. It is equally a fact that the Legislature are absolutely at a loss to find out to what purposes this funded property is applicable.

These observations under the head of drainage may appear irrelevant, but the fact is that they are as inti-

mately connected with it as the administration of the Funds of the Netherlands is with the Dikes of Holland ; without the union the country would cease to exist.

The practical drainage of estates is effected by means of a sluice or koker with a valve door, opening to the sea ; the latter is most simple and common. A wooden trough 6 feet square, 24 feet long, with a door of the above description, will drain 400 acres, but for a greater extent an increased diameter is necessary on account of the extraordinary accumulation of water during the heavy rains. Cast-iron kokers on the same plan, but cylindrical, are used with equal effect, but they are generally of too small diameters. A koker should always be large enough to prevent any fall of rain from raising the water to the surface of the earth, as in this instance the light vegetable mould, with all its salt, is washed into the trenches, and the land becomes impoverished.

Nothing is so injurious to land as imperfect drainage. When drainage is entirely stopped, vegetation decays and remains upon the surface, and the superabundance of water loosens the soil and causes it to imbibe the nutritious particles. But where land is allowed to be at one period overflowed and left dry at another, the very principles of fertility are destroyed altogether.

It is evident, therefore, that one of the most serious duties of a Manager is constant attention to the drainage of the estate, and the Proprietor should spare no expense in securing this, to secure the fertility of his fields.

An empolder is a dam of earth formed by digging a trench inside, which circumvents the portion of land taken into cultivation. This trench constitutes the main drain of the estate, with which all the fields communicate

by smaller or succour drains; 10 or 12 feet is sufficient for most main drains, but if the soil is low, or loose, a greater width will be required to make the exterior dam of sufficient strength. The best form of these dams is that of a military field work, but with the ditch inside instead of outside. No dam or trench should be without its parapet, which in a dam answers to the parapet of a field work, and in a trench to the covered way. The parapet of a dam is a support to the foundation. That of a trench, by taking off for the breadth of 2 to 4 feet from the outside of the trench, the earth from 1 to 2 feet deep, for the whole length, preserves the trench from being filled up by the falling in of the sides. One is astonished to see the immense length of drainage required, but the ease with which a trench is opened in a fat moist clay, without a single impediment of rock or stone, renders it a labour of great facility. The most faulty part of the drainage consists in the improper construction of the sea dams in which no attention is paid to those principles which in Europe are commonly practised with the greatest success. Almost the whole length of coast is at different periods liable to an accumulation of surf, that destroys the dams, and in many instances washes away great tracts of land from the front of estates. A dam is generally repaired by driving piles in rows along the beach, facing the sea, and carrying earth to fill up the breach. It is well-known to Engineers in Europe, that in many instances even a strong wall of brick or stone is insufficient to stand the swell of the sea when opposed to it without any intermediate gradual check. The breakwater at Plymouth, having a base of 3 times its height and 6 times its breadth at top, would be



insufficient, if the rocks of from 1 to 4 tons each of which it is composed, were cemented together; by being loosely piled, the wave gradually loses its force amongst the interstices before it reaches the top, or the upper tiers would soon be displaced. The sea dams in Holland, and those of Dunjennes and Romney Marsh in England, should be the models for those works in Demerara. Those of Romney and Dunjennes being on the same coast with the breakwater at Plymouth, and subject to the same channel swell, we shall instance more particularly. They are composed of rows of oak posts driven into the beach, parallel with the coast, at a considerable distance from the dam outwards. These rows, tier over tier, at intervals of from 10 to 20 feet, form a gradual set of barriers, behind each of which the sand and gravel accumulates, till it reaches the high water mark on the shore, where a dam becomes perfectly safe and practicable. By this method the force of the sea becomes gradually weakened, and the base of the dam is not only protected from the wash, but is strengthened by the deposit left behind each of the rows of posts.

In Demerara this plan is equally practicable, as it is frequently the case where old dams, in spite of constant piling, have been washed entirely away, yet these piles that were insufficient to save the old dam have saved the new one erected behind it by acting as a breakwater in its front.

#### FERTILITY OF THE SOIL.

The powers of vegetation within the tropics are such as never fail to astonish travellers from more northern regions. The Papaya, in 12 months, will rise 20 feet high

upon a straight single stem, and be perpetually loaded with fruit from the 3rd month after planting. The banana, from a single eye, or stool, will in the same time produce from 12 to 20 perfect succours, each from 15 to 20 feet high, 2 or 3 feet in circumference, and its broad foliage able to cover a space of 1,000 square feet. In a year it has been known to produce 8 cwts. of wholesome and nutritious aliment. But of all other vegetables the bamboo and the large gourd have the quickest growth; in the wet season, they have frequently been known to increase a foot or 16 inches in the course of a night.

European fruit trees grow weakly, but do not produce fruit. The descent of the sap to the root and its re-ascent after a dormant period appear to be essential to the production of the fruits of temperate climates. The partial regurgitation of the sap, produced in the tropics by the changes of the moon, is not sufficient for that purpose in European plants transplanted to within the tropics.

Though the deficiency of my experience has not enabled me to account scientifically for this phenomenon, I am yet convinced that there is a marked botanical distinction between the fruits of hot climates and those of temperate ones, which should render a characteristic division necessary beyond that of the mere Linnean distinction, some particular conformation of the generative parts by which tropical plants essentially differ from those of temperate or northern regions. Most tropical fruits have strong evergreen leaves and a consistency and flavour approaching to that of the bay or laurel. Europeans in most fruits detect a very strong flavour of turpentine, not perceptible to creoles and long residents. And all unripe fruits are so powerfully astringent, as effectually

to deter the unwary and ignorant from using them. Astringency seems to be the predominating quality of three-fourths of all the vegetables and, from the infusion of their leaves in the pools and creeks, persons unaccustomed to the use of such water are frequently, in first drinking it, seized with a violent cholera morbus; this is however merely a transient inconvenience. One would suppose that nature had so generally diffused this principle to counteract the predisposition to laxity of the solids produced by the heat of the climate. Be this as it may, the Gallic Acid is here without a competitor in the work of vegetable analysis.

The rainy season is the period of quickest vegetation; from March to June succulent European herbs may be raised with great success, and indeed throughout the year the kitchen garden in careful hands may be brought to produce a daily supply of most European vegetables, which form a pleasing variation from the usual indigenous productions, highly salutary and gratifying to the palate.

#### SCIENCES AND ARTS.

This is rather a barren subject in Demerara; individuals of talent and abilities are not rare, but no public establishments exist to give the Arts and Sciences "a local habitation and a name." The Essequibo Agricultural Society has indeed latterly been making considerable efforts to reverse its former fame, having hitherto been little more than a Mutton and Madeira Club. The late promulgation of certain rewards and prizes for improvements within its sphere, gives great hopes that it will become as respectable as a body as it has ever been in the characters of the individuals that compose it.

There is no colonial school. This want, while it exists, reflects the greatest disgrace on the country, since the education of the free people of the colony is the surest pledge of their industry and good conduct, and gives them the greatest superiority over the slave population, with which they are otherwise confounded. This is meant of the lower orders and free people of colour, who are unable to procure European education. A colonial school, on the Lancastrian plan, would rescue a most important portion of the community from ignorance at the expense of one half the income of an useless sinecure office.

There is no Botanical Garden, though many of the most valuable medicinal plants are commonly trod under foot, or felled with every portion of the forest; there is no colonial or circulating Library, though books are too expensive for general reading and though many think themselves obliged to take an extra glass of sangaree or grog, for want of better means of passing an hour or two of the most sultry part of the day. In short there are no Literary or even Mercantile Associations of any kind, but there are cock clubs and whist clubs, patronized by gentlemen whose countenance would raise and support institutions of the greatest public utility and respectability.

The public press, amidst all this, is infinitely superior to that of any other colony within the tropics, and proves at once, that if society in Demerara is not in a high state of cultivation, it is by an affectation of barbarity, and a degrading disregard of its latent advantages, which reflects shame upon its members, beyond those of any other colony under the British Crown.

The extraordinary adaptation of the colony in favor

of scientific pursuits is by no means ideal. Enlightened individuals who have sought a refuge from pecuniary exigencies, from every nation in Europe, have brought with them their natal tastes and propensities, and the constant intercourse has worn down uncharitable prepossessions and national prejudices, to a most desirable temperament of general charity and enlightened feelings. What is good in all has been duly appreciated and adopted, and what is objectionable has been with equal judgment discarded.

Fashion has not been able to exert her influence in perverting taste and overthrowing reason, and the man of mean origin and of the poorest education, after a residence of some years in Demerary, returns to Europe with his wits so much enlightened as to figure in Societies where before he dared not hope to be admitted. The theatre of his pursuit of wealth has been also his school of manners, and whilst he has hoarded his savings he has enriched his understanding.

Many a footboy has returned to be the master of the mansion where he was once a menial; many an ignoramus has learnt to write by signing bills of exchange, and many who know nothing of their birth, parentage or education, live to see an *Honourable* prefixed to their ignoble name, and to become the patrons and discriminators of select societies and good company.

These facts reflect the highest credit, both on the colony and its inhabitants, and prove beyond doubt that it possesses the means, independent of the mere acquisition of wealth, of enabling those of good natural abilities to elevate themselves from want and obscurity to opulence and respectability.

To what other origin can the oldest nobility be traced?

SLAVERY.

What a fertile thesis has this been to men in every age, whose imaginations have disdained the guidance of their judgments, and whose enthusiasm has set at naught the immemorial ordinance of their Creator. In every clime, in every age, in every nation since the creation of the world, has God ordained that a class of human beings should exist, as "servants of the servants" of the rest of the human race. And surely, if any thing could exemplify the wisdom of divine Providence, in the distribution of power and command in the proportion to the powers of intellect requisite to exercise it, it is this very fact, that slavery, from the beginning of time, has been the portion of the lowest order of humanity. It is to no purpose that casual instances of superior intellect are brought forward to contradict our ideas of the mental imbecility of those whom Providence has allotted to a state of slavery. Mind and genius, where they exist in a mass, are sure to rise and emancipate their possessors from the very lowest physical state of bondage. To endeavour to destroy the grades of society, by a levelling system that would merely reverse the duties of different classes, is an attempt that defeats its own object, and that revolutionizes without reformation. Las Casas on this very scene of South America, with the warmest feelings of beneficence, and with a perseverance of soul devoted to his object, succeeded in part in the arduous work of alleviating the miseries of slavery to which the poor aborigines were reduced by the avaricious Spaniards. But how did he accomplish this? To the disgrace of Las Casas, and all his succeeding disciples be it

spoken ; that he freed the Indian at the expence of the negro, and was the first *philanthropist* that introduced the traffic in negro slaves into the West Indies. ROBERTSON in his History of America speaks on this head with his accustomed accuracy of authority and justness of feeling, as if he had contemplated in our day the change that would again be attempted, of freeing the negro at the expense of the poor unoffending Hindu. We whose hopes are centred in cultivation by the hands of a hardy race of negro slaves, may be supposed to have somewhat of a bias in favor of their employment. But whilst it is known that, in the East Indies, a certain caste of natives are bought and sold with the soil, and that their labour is compulsory by the owner of that soil, with the sole obligation of allowing them a subsistence, not equal to one-third of the usual allowance to negroes, what purpose can it answer, that the manufacture of sugar should be transferred from the West Indies to the East, or taken from the shoulders of the robust negro, to crush the slender frame of the Hindu slave. It is true that the distance of the East Indies is greater, and they may suppose from this, that the tears of slavery from that circumstance may be weakened in their effect, or drowned in their passage. But how is humanity bettered by this subterfuge ? Slavery must still exist, though at the distance of a six months voyage instead of six weeks. Nor can any arrangement prevent it as long as commerce gives the inhabitants of one climate the means of enjoying the luxuries of another situated within the tropics. In these regions, where indolence and ease are the natural predisposition of mankind, nothing but compulsion will procure that superfluity of the productions of nature which

is necessary to carry on trade and commerce. The power that compels this, in whosever hand it lies, must create in the inferior grades that state of forced subservience which can only be denominated slavery. It signifies not whether England be herself the slave trader; as long as she uses coffee, sugar, cotton, rum, indigo, silver, gold, chocolate, rice, tobacco, so long must she virtually support the system of slavery, for without slaves and their labour, either negroes, Indians or Hindus, Europe would never enjoy their luxuries.

To what purpose then is this outcry against slavery that has blinded the eyes of politicians and nearly thrown the staff out of the hands of Great Britain. Ships, colonies and commerce; are they not the sinews of her strength, and how are they supported? Without freight how many fleets would train their crews in voyages to either India? And what is that freight? All that she procures from her own dominions is produced by the labour of her slaves. Nor can it be otherwise. The European labourer is unequal to the influence of the tropical sun. Should he escape his seasoning, and labour to his utmost, even that utmost dwindles to a comparatively small proportion, and a very few years reduces him, with relaxed habits and an emaciated frame, to the miseries of a premature old age. Under the same sun, the negro thrives and enjoys himself, and though he would willingly not work, yet his labour keeps him in health and temperance. The power that tempers the wind of heaven to the shorn lamb knows this, and has also declared to man in all his shades and colours "In the sweat of thy brow shalt thou eat thy bread."

Even the stoppage of the slave trade of Great Britain



has only had this effect, that it has thrown that trade into the hands of other powers, with whom it is notorious few of the scruples of humanity exist that dictated the comparative care of their unfortunate crews for which the British traders were famous. Spanish, Dutch, Portuguese, French, in ill-appointed ships, deficient in every convenience, still drag the African from his native shores, and enable other powers to undersell the British Colonies in every European market. WILBERFORCE, however good his motives, has only accomplished this; he has taken from the negro a lenient master to give him one with a hand of iron. He has destroyed an English monopoly and admitted the whole world. He has literally, to use a coarse proverb, like the tinker, mended one hole, but he has made ten. By raising a furious outcry, he has secured to himself the character of an enthusiast, but future ages will for ever deny him either that of a philanthropist, or a politician.

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## *Our Peasant Population—Their Past Condition and Future Prospects.*

*By Seaforth M. Bellairs.*

**I**T would burden a short paper like this too much with statistics to go into all the exports of this colony, nor is it necessary, as I imagine that the amount of money that finds its way into the pockets of our 'Peasant Population' from timber, charcoal, coffee, &c., &c., is very much the same now as it was in the early eighties.

In the present article I shall endeavour to show the effect on the pockets of our Peasantry, caused by the economy necessarily practised in the production of our staple export, sugar, with its 'offal,' to use the convenient but not very pleasant word, and also to try and see what, we may hope, will supply the blank caused by such economy.

In order to show the difference in the incomes of the peasantry, let us compare the wages paid across the pay tables of the sugar estates some few years ago with what are paid at the present time. Let us take the five years, 1881 to 1885. On looking up the books of an East Coast estate I find that the crops of these five years was 4,880 hhds., and that the total amount paid in wages was \$218,217.11 or \$44.72 per hhd. The total exports of the Colony for the same period were 616,028 hhds. or an average of 123,205 hhds. per year. Therefore if we take the low figure of \$40, as the amount per hhd. paid in wages, and that I think is low, for the estate whose figures I have quoted was conducted on careful

and economical lines, the amount paid in wages across the pay tables of the sugar estates of the Colony during the year averaged \$4,932,200. The crop for the present year promises to be a good one, but, even if it reaches 110,000 tons, the amount paid for wages shows a fearful falling off. One of my planter friends assures me that his wages account for this year will not exceed \$21 a ton. Suppose that the wages paid throughout the Colony average \$25 a ton, which I believe is rather high, then the amount paid for wages will be only \$2,750,000, as compared with \$4,932,200 twelve years ago, showing a deficit of \$2,182,200. This deficit would take nearly the whole of the gold exported during the year to fill. The gold industry came into existence just at the end of the period I have quoted. Practically it began in 1884, before which date the amount exported was so trifling as not to merit consideration. I suppose it may be considered that nearly every penny of the value of the gold exported has found its way into the pockets of our peasantry, for, for one of the employers who have made money, there must be ten who have lost.

But there is another side to the question of the deficit in the amount of wages from sugar that finds its way into the pockets of our peasantry which makes the matter worse still. The present wages, small as they are compared with what they used to be, are paid almost exclusively to the indentured and resident labourers; very little indeed goes into the pockets of those who do not live on the sugar estates. There are at the present moment about 18,000 indentured immigrants, and if these earned an average of \$1 a week, it would take \$936,000, leaving only \$1,814,000 for other labourers, of which sum

the unindentured immigrants and the resident labourers would have the first refusal. The unindentured immigrants alone number about 70,000 persons, a large proportion being, however, women and children. The last census showed a population of agricultural labourers numbering 108,225 in the whole colony. I do not assert that the indentured immigrants do earn an average of \$1 a week, but, if they chose to work with a will for the whole six days, they could easily do so, and they must be provided with work first. It will therefore easily be seen what a terrible falling off there is in the income of our peasantry from the sugar industry, and up to now nothing seems to have taken its place except gold.

Gold cannot provide general employment; none but the young and strong men can work in the gold bush, and what they earn does not benefit the Colony as much as did what was paid across the pay-tables of the estates. In the first place, a great part of their earnings is paid in food, and nearly the whole of this food is imported. The existence of these men in the bush is but of very little use to the provision grower, the cattle farmer, or cow minder. On the estates the labourers bought plantains and cassava from the farmers, occasionally a bit of meat from the butcher, and a pint of milk from the cow minder, but in the bush it is nearly all imported food.

Again the amount of their earnings which is paid in cash is not paid as on estates, it does not come as a fine, gentle shower every Saturday, no, it is a deluge of money after months of privation and the consequence is that like a deluge of rain, instead of fructifying the soil, it rushes off and disappears no one knows where and benefits no one knows whom.

If—or may I say when—quartz crushing is established the gold industry will be on a very different footing, but up to the present it has not proved the universal panacea that was expected.

If gold does not fill the pockets of our peasantry what else will?

Cane-farming has been suggested, but the ideas of our people must be less exalted than they are at present before they will take to Cane-farming. The ordinary labourer does not like planting canes if at the time he plants he does not know what he will get for his crop when he reaps it. He will tell you that it is different with plantains and such things, if he is not satisfied with what SMITH offers he can sell to JONES, but with Cane-farming he is obliged to sell to the Manager of the Factory to which he is attached, and he thinks, to use his own language, that the Manager 'will take advantage of him.' A man having canes at—say—Beterverwagting must sell them to *La Bonne Intention*, and a man at Plaisance must sell to *Vryheid's Lust*, but even if the peasant would learn to believe that he would be fairly dealt with, the prospects are not very encouraging in the present state of the sugar market. Even by combination 100 men could scarcely manage to tackle 400 acres, that is a man to 4 acres; these 4 acres would only produce 6 tons of sugar. Many people talk glibly of two or more tons to the acre but the statistics of the colony do not bear out these figures. The acres under cane cultivation in 1894 were officially declared to be 70,012 and the exported crop was 102,502 tons of sugar, less than a ton and a half to the acre. If 2,516 tons were consumed locally the production would be exactly a ton and a half to the

acre. Now if a man grows 6 tons of sugar a year, the Factory would take half, leaving him with 3 tons as representing his year's work; 3 tons are 6,720 lbs. which at 2c. means \$134 40. Supposing \$30 to have gone in manure, the net income would be \$104 40, or just over \$2 a week. Many planters think that 100 men could not tackle as many as 400 acres, but I think that if it could be arranged that 200 acres were cut in October and the other 200 acres left over until the first 200 were 'established' it might be done. Under the present system of cutting nearly everything within three months, the men would have more work to do than they could manage when cutting canes and for some time after, and then scarcely anything at all to do for several months. Under the present system of reaping all the crop at one time it might be advisable that the men would adopt the Barbados system and plant only 200 acres in canes and the other 200 acres in provisions or other produce. In this case their sugar crop would average only 3 tons of sugar per man, or deducting the half claimed by the Factory, only  $1\frac{1}{2}$  tons, or \$67 20 a year per man from the Cane-farms.

Cane-farming is only another development of the Sugar Industry, let us see what fresh fields and pastures new we might have.

Well, after considering Sugar and Gold the next most important thing is, perhaps, Rice. But here again our black population would have to enter into competition with the East Indian Immigrant, who probably will almost monopolize this industry. The 'coolie,' to use the usual but incorrect designation, is perfectly happy if he has a trash house with a smooth mud floor, good grazing for his beloved cattle, a plentiful supply of good water, and

congenial society. He likes to live in a healthy place and delights in seeing his family sleek and well. The paradise for coolies seems to be parts of the Corentyne Coast. There they find everything that they desire to make life happy, and the time they devote to rice cultivation is to them recreation for their spare hours. They pay no wages, and if they were not busy with their rice they would only be idling. Rice growing to them is in a way what cricket or bicycling is to us. The growing of rice has been the occupation of the coolie for thousands of years, and if the principles of heredity are at all correct the coolie will take to rice growing as naturally as a setter will take to setting. The black man is quite different. Although the coolie is so penurious yet the black man is fonder of money than the coolie, with this great difference, the black man likes money for what it will bring; he likes to spend it, whereas the coolie likes money for itself; he likes to hoard it; the black man likes to earn a lot and spend a lot, the coolie is content to earn a little and spend less. If rice growing ever becomes a big industry, and there is no reason why it should not, I expect it will be almost exclusively in the hands of the coolie.

We must also consider coffee and cocoa, but these are scarcely applicable to our coast lands; they take many years before they yield anything, and, I am told, that if this cultivation were attempted on the coasts, a breakage of the draining engine or any accident that might put the cultivation for 48 or more hours under water would result in the loss of several years' labour. Dr. MORRIS pointed out that when our population spreads from the coast to the interior they will probably find a great variety

of land and climate, and possibly British Guiana may be able to grow everything that can be produced in the tropics.

There is also another product that is now engaging the attention of well-wishers of the colony, that is fibre; it seems strange that a colony like this, where there are so very many fibre producing plants actually growing wild, should import close on a million bags every year; bags made in India, a country not so very dissimilar to British Guiana. The Royal Agricultural and Commercial Society have asked the Government to try and incept this industry by offering a large premium to anyone who produces and places on the Colonial market a bale of bags suitable for sugar or rice, which bags must be exclusively creole, that is, the material must be from plants grown in the colony and the making of the bags, from the steeping of the plants to the sewing of the bags, must be entirely done in the Colony.

NÁPOLEON the First offered an enormous reward to the first person who would put a certain small quantity of sugar entirely French on the French market, and that small quantity has grown into the enormous beet sugar trade of the continent of Europe.

If we cannot export bags, at all events at present, I see no reason why we should import them. The great argument against the fibre trade is that we should have to compete against India and that fibre is produced so excessively cheap there, that it would never pay.

Labour in India is paid in silver whereas we pay in gold. A man getting ten rupees in India can buy with it nearly as much as he could before the rupee was depreciated, when ten rupees went to the Pound, therefore the merchant who buys bags by the rupee and sells them by sterling



makes an enormous profit out of the depreciation of value of the rupee. He has only to send out a little more than half a sovereign to pay the ten rupees. To paraphrase Mr. STEAD, it is impossible for the black man with the yellow money to compete with the brown man with the white money. This argument, just as powerful against growing rice as it is against growing fibre, may or may not be true; experience alone can tell. Fibre grows quickly, there is not very long to wait for the result of one's labour, and if we are not content to export the fibre in its raw state but make bags, we establish new industries of spinning and weaving, in fact all that we should have to import for our bags would be the needles that sew them.

Another industry which may grow up in the future is the fruit trade. Here the trouble is our distance from the market; how can our fruit compete with that from Jamaica and the Canary Islands when it must be two or three days longer in transit? But we might export canned fruits or jams. The specimens of jams exhibited at the Horticultural Shows are not very encouraging, and I expect they cost much more than they would fetch in the market, but no one would dream of making jam for commercial purposes in a copper stew pan over a charcoal fire in a coal pot. Perhaps if guavas were grown by the hundred acres, and jelly were made carefully wholesale in a "copper wall," or perhaps even in "vacuo," it might be turned out so cheap that it could compete with European jams in the markets of Europe and the States. Some say that our jams would never suit the taste of the people. All I can say is that I remember well when the acme of luxury was supposed to be turtle soup, roast venison, pine apples and guava jelly. I have seen

canned pine apples in England, but I do not remember ever having seen any other of our tropical fruits canned. I think that the mango, if not quite ripe, and the mammee apple, would bear canning very well, in fact I should think that any fruit that will bear cooking would stand being canned. I am afraid that such fruits as semitoes and sappodilloes would not bear it.

Another small industry is butter ; why should we import so much butter ? Mr. HARRY GARNETT has shewn us that butter can be made here and that too of excellent quality. I do not know if it pays Mr. GARNETT, but we must remember that it is not his business, only a hobby, and hobbies rarely pay. Because an Earl does not make anything out of his green-houses it does not follow that a market gardener cannot make them pay.

I should like to be able to say something about tobacco, but I know so very little about the capabilities of growing tobacco. We all know however that the Island of Cuba is in a very bad way, and "there is always something not wholly displeasing in the misfortunes of one's friends." It is quite possible that tobacco of excellent quality might be grown in some parts of the colony, and there is no reason why we should not learn how to cure it both for cigars and ordinary tobacco.

Again there is cotton, we know that cotton can be grown here, and the reason why the export of cotton was abandoned was the high wages asked by our labourers, but now that the wages have come down so tremendously, it is possible that cotton may be grown at profit, especially as the oil from the seed is now in so great a demand.

When Mr. HOGG was giving his evidence before the

Select Committee on Sugar Industries in 1879, he said that Demerara was like a garden, and Mr. ONSLOW asked him (question 4,487):—"That is to say that although Demerara is like a garden, you can only grow one crop." Our present attitude would make this question still applicable, only the words "and export a little gold" might be added.

If we do not find some other produce besides sugar to make up for the downfall in the wages paid to our peasantry we shall approach the condition of that unfortunate island, whose inhabitants, according to the midshipman, 'made a precarious living by taking in each other's washing.'

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## *The Boa-Constrictors.*

*By F. F. Quelch, B. Sc. Lond., C.M.Z.S.*



THESE reptiles possess a somewhat special interest for residents in tropical America, seeing that they are at once a pest and a pest-destroyer in the general economy of nature. The term, *boa-constrictor*, in common parlance, is applied to any snake that secures its prey by enwrapping and crushing it to death, and it is more frequently used perhaps to denote the great pythons of Asia and Africa than the constricting snakes of tropical America, to one species of which—the great land *boa*—in a strict system of nomenclature, the name rightly belongs. The *Boas* are thus, typically, the constrictors of the New World, though they are not confined to it.

Locally, the word *Camoodie* is synonymous with *boa-constrictor*, and the various species are denoted by such terms as *Water Camoodie*, *Land Camoodie*, *Tree Camoodie*, etc. Generally, however, the water species is referred to particularly as *Camoodie*, this being the commonest, or at any rate that one which is found most frequently, close to the haunts of man; and as it is also the largest, it has come to figure in the public mind as the typical *boa-constrictor*, in place of its land congener to which the name belongs.

This group of snakes will readily be recognised here by two very simple characters. The jaws are long, and carry each a series of more or less curved and elongated teeth; and the top of the head is covered with small

scales, of much the same size as those over the body, and not with the larger shields or plates met with in the harmless snakes.

Of all the species, the water boa, which is known technically as *Eunectes murinus*, will be most easily recognised. Its markings and colour are nearly the same in all individuals and at all ages. Above, it is of a glossy brownish black, with a double row of large oval black marks, arranged transversely: below, it is mottled or streaked with black and yellowish white; while along each side there is a series of yellow patches surrounded by a black border.

During life the tints are vivid enough, but when the snake is preserved, or the skin taken from the body and dried, the colours become dull. The skins, however, are in great request for slippers, belts, pouches, and other similar, useful or ornamental, objects.

In size, this water boa seems to exceed all other snakes; and it would appear to be more deserving of the ancient name, Anaconda, than the Eastern forms to which it was first applied. In fact, it may be said that the name is almost limited nowadays to this tropical American species. The length is known to reach quite 37 feet, but it is said that much larger specimens have been taken. On this point, however, it is hardly safe to express an opinion, since unless definite measurements are made, the estimate of size can be of little value.

A case in point, which would suggest caution in accepting the great lengths ascribed to certain animals, may be quoted from the writer's experience as regards the large Black Alligator, locally known as Caiman (*Alligator niger*). The length of this form is given by

various travellers in the colony, as for instance by both BROWN and SCHOMBURGK, as from 20-25 feet, WATER-TON even recording 30 feet ; but there is no statement of actual measurement. In the writer's experience, the largest forms of this species, taken in the very districts referred to by the forementioned travellers, hardly exceeded 14 ft., though when seen in the water they appeared to be considerably larger. A similar example may be found in the great Arapaima fish (*Arapaima gigas*), which is recorded as from 16-18 feet in length, while in reality they hardly attain to more than half that size. Actual measurement is requisite in all such cases.

Skins of the water boa, of from 18-25 ft. in length, are frequently obtained ; and in the sheltered swamps, and along the creeks in the recesses of the forests, it may well be that considerably larger animals would be met with. The following experience along the higher Essequibo River tends to support this. In 1894, while passing by a wide outgrowth of closely matted grass from the swampy bank, the boat disturbed an enormous snake, of which the head, neck and part of the body, were clearly seen at a distance of certainly not more than five feet. It was noticeable that the head was considerably more than twice as large as that of one of about 20 ft. and this seems to indicate a snake of very large proportions. The unfortunate part of the matter is that snakes of very great size are most likely to be seen in places where it is out of the question to secure them, as it happened in this particular case.

The body of the water boas is thick in proportion to its length, and cylindrical, owing to the strongly de-

veloped dorsal muscles from which they derive their great strength. The males, as a rule, are more elongated, and the females thicker towards the end of the body. In this species, as in the other constrictors, rudiments of hind-limbs are found in the form of claws, one on each side of the vent.

These snakes are aquatic, and frequent especially the grassy and sheltered banks in the still reaches of the streams, and the wide, open water-savannahs. They are widely distributed in all such places over the colony, and are abundant in all the coast districts, more especially in the sheltered water-ways close to settlements in the country where poultry is reared. Small specimens up to about 10 feet in length are very frequently caught in such shallow waters, and larger specimens are met with occasionally lying on the grass or tree-stumps by the water-side, or in the act of constricting or swallowing their prey, when they seem, as a rule, altogether disinclined to move, except so far as the contortion of their body for swallowing is concerned.

It is mentioned on apparently good evidence that after having swallowed an animal of large size, these creatures lie torpid, and are incapable of escaping if disturbed; but to the writer's knowledge no such case has ever been met with in the colony, and it may be doubted whether snakes that were big enough to take in large animals would be afterwards incapable of movement, the more especially that they are little likely to be far away from the moist bank of some waterway.

From the habitat of these reptiles, it is not difficult to see that they are well situated for securing their food. From the abundance of creatures that slake their thirst

by the waterside, the boas are able to secure all that they need, and they certainly make good use of their opportunities, for when caught, they are always well-nourished and fat. Rodents and birds seem to be favourite articles of diet, not only with this species, but with the generality, if not all, of the constricting snakes.

The part which these and kindred reptiles play in maintaining the balance of nature in a group of such remarkable fecundity as the rodents, must be therefore of considerable importance to man in the tropics, the more so that the greater number of rodents are among the most serious depredators on cultivation in general.

It must be stated, however, that the range of food of the boas includes a great variety of other animals, such as the great Salempenta or Teguxin lizards, and the alligators, besides the smaller mammals generally, and even the small wood-deer and the peccary. The securing of prey such as the mammals or birds, is ordinarily an operation of short duration, since the highly organised animal being once enwrapped, succumbs rapidly under the enormous pressure of the folds about its body. It is not often, therefore, that an observer comes upon the field during the process, except when poultry has been seized close to a dwelling, and their cries have attracted the attention of the inmates.

In the case of the alligators it is far otherwise, and the process is always a long one, taking on the character of a combat except where the snake is disproportionately large. In one case observed, the contest certainly extended over two days; and it would seem that, if the snake once succeeds in infolding the alligator in its coils in an advantageous position, the latter must succumb,



the result being only a matter of time depending on their relative size.

In all the cases observed, the contests took place in the grass-covered swamp or marsh by the riverside, the alligator struggling fiercely with head, legs and tail, turning about, heaving and wriggling, in a vain endeavour to cast off the boa. It is remarkable that even when the alligator is of a size such that it might by wriggling reach the deeper water, it seems to avoid it, perhaps from the recognition that, in the water, where they would both sink to the bottom, its chances of holding out, under the pressure of the snake's folds, would be lessened.

On land, the continuance of the struggle depends on the crushing power of the boa, and the resistance of the alligator—dependent on its size—to suffocation—a process that in these mixed blooded creatures is only effected with considerable difficulty. Possibly cases may occur where a small boa attempts the impossible and has eventually to abandon it; but in those that have been under observation, the sizes have been such that, while by means of the head, tail and toes, the alligators have been able to toss and wriggle about to a greater or less extent, they were evidently under stress of partial suffocation. For long intervals they would remain perfectly still, perhaps from collapse, or with the expectation that the boas might consider them dead and proceed to unfold them: and then again they would struggle furiously, but equally to no effect.

It is a curious thing that under such circumstances, a boa will allow of quite close approach without its attempting to escape or attack if interfered with, and in fact the

same thing takes place where poultry has been seized and is still in the coils. Disturbance only causes the snake to bind its folds tighter about its prey, as if to prevent its escape, and the reptile can be easily killed—the only compensation in the case of the poultry.

In isolated country settlements where there are quite water-ways with grassy or bushy banks, the water boas become a serious nuisance, and cause considerable loss of poultry; and if there happen to be no open spaces, except the dams along the waterside, where the birds are constantly liable to be seized, the keeping of poultry may be quite an impossibility.

These snakes, and in fact the boas generally, thrive well in confinement in the tropics; and if they be kept regularly supplied with water and food they can be handled with impunity at almost any time except during sloughing, when they are apt to be irritable. The water should be sufficient to allow them to immerse themselves entirely. Their growth is by no means slow, a small specimen of less than four feet, fed on a diet of rats—of which they are very fond—having reached a length of nearly ten feet with proportionate thickness, in about six years.

Occasionally a specimen refuses to take food, and it is surprising for how long a time they are able to exist without feeding, and with but little apparent decrease in size, if any. A specimen, kept in a narrow-meshed wire cage in the Museum, some years back, refused to eat for 19 months, though it would lie in the water for long intervals; and it seemed at the end of the time to be about as plump as it had been before. Here there was no chance of food being obtained surreptitiously, for the small

meshes prevented even a mouse from penetrating inside and the cage was always under lock and key. Cases of even longer intervals are mentioned as having occurred, but it does not appear that the element of chance feeding was eliminated.

With but two exceptions, in an experience of 10 years with several dozens of boas of different species, living food (rats) had always to be given to them; and if this seems a cruel proceeding at first sight, one has only to be reminded that it is about the quickest way of destroying the rats, certainly quicker than drowning them oneself, or allowing one's dogs to kill them. The sentimental picture of these creatures trembling with fear under the dreadful fascination of the snakes, is but a figment of the imagination. After an experience of many years with a very large number of S. American snakes, poisonous, constricting and harmless, in relation to living animals—mammals, birds and other creatures—both in confinement and in open nature, the writer knows of no single fact, nor has come in contact with any observer who can produce any fact, supporting the so-called fascination of animals by snakes. That certain animals may become absolutely paralysed by fear and incapable of movement at the sight of a snake's approach, is in no case different from the corresponding manifestation of profound fear and collapse on the part of many animals in the presence of extreme danger.

In the case of rats, at any rate, there is not only no sign of any such fear, but they even appear to be more than callous, often attacking and badly biting the snakes if the latter be not hungry, and rendering their removal necessary.

The instances of the two snakes—one a land boa and the other a water boa—naturally eating dead animals placed in their cages, appear to be quite exceptional, for in other specimens such consumption was only brought about by strategy.

Properly fed and taken care of, the water boa, and the land boa also, become extremely quiet and gentle—perhaps, more truly, sluggish—in their movements, and a large specimen of the former, over 20 feet in length, manifested in confinement not the slightest inclination, nor made the slightest attempt, to attack when disturbed, or even when quietly handled. These reptiles are nocturnal in their habits, and, when they have the chance, seek out dark corners in which to shelter themselves from the light.

When these snakes have become accustomed to a special diet, such as rats for instance, they seem at times to neglect, even when they are in want of food, other creatures that at first they would have seized upon at once. Thus a large Salempenta or Teguexin Lizard has remained for years in a cage with a water boa, unmolested, even when the latter has been hungry, and has taken four large rats in succession.

It is a common belief that the boas lubricate their prey before swallowing it. There is really not the slightest foundation for the belief. After the object is dead, the snake usually passes its head along or about the body, perhaps to get some idea of the size, but more likely to find the situation of the head, at which part it almost invariably starts to swallow. At this stage, there is no saliva on the object; but if, after it is partly swallowed, it has to be rejected on account of

too great size, that part of the body which had been in the snake's mouth and throat will be found to be abundantly covered with the saliva poured out during the process of swallowing. In confinement, at any rate, it not unfrequently happens that objects are thus disgorged after being nearly taken down ; and it would seem to be due to their being too large, the snakes attempting, through hunger, to prey upon what, ordinarily, in nature, would be left alone. The salivation, therefore, is not the preliminary to swallowing, but the result of it.

The operation of swallowing, which in all snakes is very considerably prolonged, becomes slightly modified in the constrictors owing to the use of the folds of the body in holding the prey, so that they are enabled to push their jaws more easily over it. As in these forms there is generally a greater disproportion between their size and that of the objects swallowed, than in other kinds, this hand-like action of the coils of the body becomes of importance.

Their anterior teeth, too, are stronger and more recurved than in other non-venomous snakes, and are directly of use in securing a firm hold of their prey, and thus in allowing the coils of the body to be thrown with certainty and lightning-like rapidity around the object, ere any act of defence can take place. Animals with strong and sharp teeth, such as the Peccary and the Capybara, would make but short work of the slender neck of the snakes were they not rendered perfectly helpless by the enwrapping coils at the very instant of seizure. Thus secured, any movement or struggle on the part of the prey, is only met by a tighter clasping of the coils of the snake, nor are they relaxed until all

breathing has ceased, the cessation of the respiratory and circulatory movements being easily detected under the tight clasp. Even after the death of the object, the tightening of the coils about it can, by artifice, be at once brought about by the slightest disturbance of the body, even at the very time of uncoiling preliminary to swallowing.

There is a natural dread of these great water serpents among all native people, but attacks on man by them would seem to be of very rare occurrence, and only one instance has ever come directly to my knowledge. In this case, a boy washing rice in a calabash by the waterside of one of the large creeks, was seized by the hand by a medium-sized snake, and it would perhaps have terminated fatally, but that the boy's father, who was chopping wood close by with a cutlass, at once despatched the reptile. From the circumstances of the case, it is very likely that the attack was accidental. In the characteristically dark-coloured water of the creek, it is hardly possible that the boy could have been seen by the snake. The probability is that the sound made by the calabash in the water, was mistaken for that of some animal drinking, and the attack made accordingly. This seems more likely still from the fact that there was not the immediate coiling around the boy so characteristic of the attack of these creatures, and it is probable, that if the boy had been able to keep still and allow of the withdrawal of the long curved teeth, the snake would have sunk again from sight.

The above explanation may seem a fanciful one, but it is hardly possible that, under the abundant opportunities for the favourable attack on man by these water boas under local conditions, there should not be many cases

known, if man were not naturally exempted. The fear of being seized by these reptiles, which deters so many timid people from bathing in the creeks and rivers, is no doubt natural enough, even if such seizure may only happen by mistake; but the chances of danger are so infinitesimal that they are hardly worth regarding.

Unlike the other boas, but like water snakes and vipers generally, the anaconda is ovo-viviparous. The eggs are retained in the body until the young are fully developed and are able to look after themselves. It seems to be generally thought that the young are hatched out in the body of the parent, and crawl forth themselves, but to judge from what has been observed in other ovo-viviparous snakes, this is not really the case. The egg membranes are complete and unbroken at birth, and the young break through after extrusion. This was certainly the case in three separate instances observed by the writer,—two in the rattlesnake, and one in the closely allied labarria—in each of which more than twenty young ones were thus brought forth. No doubt, at the time when the young are sufficiently developed and are ready for birth, their wriggling movements induce their extrusion, but the eggs are strictly not hatched till afterwards; and the young can be seen closely coiled inside the transparent membranes, until they disrupt them and crawl about.

It may possibly be the case at times that the adults are placed under conditions not suitable for the bringing forth of the young, and that the latter are then retained until they do actually crawl out; but in the light of the three instances above quoted, this can hardly be regarded as strictly natural. That unfavourable con-

ditions do modify the breeding habits of snakes, is of course well-known, and a case in point may be given from the egg-laying Aboma (Epicrates.) A specimen which was brought to the Museum, some years ago, in a closely nailed box, was observed at the time to be laying, a few eggs being found in a corner of the box, of which two are still preserved in spirit. The snake was placed in a large wire cage—open to light on all sides—together with a set of reptiles, which included four land and water boas, a Teguxin Lizard and an iguana. Some six months afterwards the Aboma was noticed to have brought forth several young ones, which were quite strong and healthy. Whether it was due to the change from the dark box to the exposed cage, or to the presence of the other occupants, there was no doubt but that the snake had retained the eggs until the young were born, and thus departed from its normal habits. This case was reported in this journal at the time (*Timehri*, 1890, p. 370).

The sense of hearing in the anaconda appears to be much more acute than either sight or smell. On frequent occasions when rats have been placed in close proximity to the cage, not until there was a squeak from them did the snakes begin to move about from one part of the cage to another as though seeking them. And even when the rats have been placed inside the cage, the snakes have often seemed unable to detect their position unless they have come actually in contact with them. The slightest touch, however, is generally sufficient, not simply for the grasping of the prey by the teeth, but for a rapid coiling of the body, independently, at whatever part the touch may take place. In this latter way,



Teguexin Lizards have sometimes been grasped while moving about (after having been in the same cage for months or years), being mistaken, by contact, for the rats whose squeak had been heard.

It would appear that this acuteness of hearing, as compared with sight, has been brought about by the conditions of life in the water, in which sound would play a very large part in notifying the approach or presence of animals. In the land and tree boas, as in snakes generally, the sense of sight is much more acute.

Sight no doubt, even in the anaconda, must be of great importance, since the recollection or remembrance of surroundings would presumably depend on this faculty. A noteworthy example of this may be given in the case of a small specimen of about 8 feet, which, when placed on the Museum floor while its cage was being cleaned, after a time found out and occupied a dark recess—where it was entirely hidden from observation—some distance away, and reached by a circuitous route between the exhibition cases on the floor. More or less time was occupied in finding or reaching the shelter at first, but after a little while, the snake invariably made for this place as soon as it was taken out of its exposed cage, and it was always found coiled up in the furthest corner from the light. This was the regular procedure for more than two years, until the cage was moved away into another room. But the most striking feature in the matter is that now, four months after the transference, it is still able to remember the shelter, and the way to it from its former position.

Before leaving the subject of the anaconda, it is perhaps worthy of mention that, among many of the common people, there seems to be a belief in the efficacy of the

oil obtained from its fat, for the treatment of rheumatic and such like pains, just as there is also in the case of the fat of the electric eel. The shocks from living electric eels are equally believed in by the East Indian immigrants as curative of such pains.

Very different in appearance from the water boa is the common land boa or land camoodie (*Boa constrictor*). The body is crossed by a series of purplish or reddish-brown, irregular or bi-concave saddles, connected at the sides, and enclosing between them lighter oval or irregular patches, which are usually emarginate in front and behind. Along the sides, arranged transversely, there are elongated or oval purplish patches with lighter centres. The head, too, is much more angular and wedge-shaped, and the scales on top are extremely small and fine.

The general colouring is very variable in this species whether the individuals be young or old, being at times very dark and intense, and at others quite pale, independent of the brightness and iridescence which always accompanies exuviation. These are the snakes usually taken for performances in menageries and circuses, but it may be doubted whether they are as suitable for the purpose as the water boas, which, when regularly fed and supplied with water, are altogether more quiet and sluggish.

The largest specimen of this snake taken in the colony to my knowledge, measured just over 14 feet, but much larger are said to occur, a length given by one bushman being 26 feet. As the latter specimen, however, was not secured, the apparent size may well have been considerably larger than the actual. Snakes of from 8 to 12 feet are not of common occurrence, but they are occasionally met with. Smaller specimens are more common.

It is somewhat curious that this is the only species which in confinement has ever, to the writer's knowledge, directly attacked other snakes. Accidental cases of the swallowing of one boa by another, as recently happened in the Zoological Gardens of London, are well known to be due to the fact of two snakes attempting to swallow the same object. Such an attempt will very frequently be witnessed among young snakes in general when they have not been fed for some time, and in fact, almost invariably happens where several specimens are kept together. In the cases referred to, however, the attack was direct. In one, as reported in this Journal (*Timehri*, 1887 p. 133), a young boa of three feet in length attacked a large yellow-tail (*Spilotes corais*) of eight feet, and attempted to constrict it, but was eventually defeated and swallowed by the yellow-tail. In another, also narrated in this Journal (*Timehri* 1890, p. 371), young specimens of another boa—the Aboma (*Epicrates*), were attacked and swallowed. In these instances there was no attempt at swallowing the same object, there being no food in the cage. That the two occurrences were unusual, would certainly seem to be the case, however, for other land boas have frequently been kept with other snakes without any such result.

In this, as well as in other species, the chief differences in habits from those of the anaconda, arise from the difference in their habitat. Though the land boas are frequently found by the waterside they are seldom, if ever, actually in the water. They secure their prey on land, or among the branches of trees, and are as truly arboreal as terrestrial. The hollow trunks of trees, or the sheltered corners between their buttresses, are

favourite places of resort; but while seeking their prey, these snakes take up more advantageous positions, such as on the low bushy growths or decayed stumps by the banks of the creeks and large rivers. Though they are at times encountered in open daylight, they are chiefly nocturnal, as in fact is the case with the group of snakes as a whole, and they are much less frequently met with, therefore, than the general reader would suppose. A fertile imagination no doubt pictures the tropical forests teeming with snakes and other noxious forms, but the reality is far otherwise.

The Aboma or Ringed Boa (*Epicrates cenchris*) has already been referred to. It will readily be recognised by the bright ruddy-brown colour, and the series of large, thin, black irregular rings along the back. The sides are marked with dark blotches having lighter areas within. The neck, as in the water boa, is but slightly thinner than the head, which is thus not distinctly wedge-shaped as in the preceding species, and the scales along the lips are slightly depressed, forming shallow pits.

The vividness of the iridescent tints of this snake in sunlight, more especially when it has just cast its skin, is altogether indescribable, and in the path of sunlight, the curving body presents a continuous series of rainbow-tinted gleams. Out of direct sunlight, it is quite sombre, giving no indication of remarkable brilliance, and it would be difficult to imagine that any such change could take place.

The habits of this species are practically the same as those of the common land boa. The size to which it attains, however, appears to be much less, a length of twelve feet being quite exceptional. They are found

much more frequently in the forest districts than in the open lands.

The three remaining boas—species of *Corallus*—are very sharply marked off from the preceding forms, by the deep labial pits, which are distinguishable at a glance. The most striking of the three is the green tree boa (*C. caninum*) which, as in the case of young anacondas, frequents the low bushy growths by the riverside, on which, owing to their colour, it is very difficult to detect them.

The prevailing green colour of the back is varied by a series of white mosaic mottlings arranged transverse to the body, giving to the species a very characteristic appearance. In young specimens, at any rate, the colour seems to be very variable, the green often giving place to bright red, the white mosaic being the same. In the writer's experience, no small green specimens have ever been met with in the colony, while young red ones are fairly common. On the other hand, no large red individuals have ever been seen, only the green ones. In preserved specimens, in which the tints have been more or less lost, the red and green examples are almost indistinguishable; but while the red colour is quickly destroyed and the specimen becomes quite pale, the green lasts quite brightly for a very long time, more especially in spirits. In life, however, the difference in colour is most remarkable.

Throughout the colony generally this form is often confounded with the green labarria, the enlarged anterior maxillary teeth being mistaken by the ignorant for poison fangs. The structural differences, however, are very great, while the very noticeable white markings along

the back will at once distinguish this non-venomous species from the Crotaline form.

Among the Carib tribes this snake is known by the name *Wy-o-pomoi*. It is termed by them a "bad" snake, and possibly this refers to the severe gashes which it can inflict with its long teeth.

The two remaining species of *Corallus* very closely resemble each other in their general form. They are elongated and slender, much more so than the other boas, and the neck is sharply constricted giving a triangular shape to the head. The body is marked by alternating series of transversely elongated, dark brown or purplish blotches, often enclosing paler spaces; and on each side of the head, behind the eye, is an oblique dark-brown streak.

In the commoner species (*C. hortulanum*), the ground colour is a pale brownish-grey, and the head is marked by a dark streak in the middle, and by two at the sides, one passing along each eye; while the blotches along the body are sub-rhomboidal and more or less clearly defined from each other,

In the other species (*C. cookii*), the ground colour is much more yellowish; the head is more irregularly mottled or marbled, and the blotches on the body are much more variable, being less distinctly defined and separated. Size for size, too, the scales are less numerous than in the former species.

In their general colouring both these snakes are very much like the venomous *labarria*, and in fact are often mistaken for it by colonists generally, the elongated anterior teeth being confounded with true poison fangs.

Time after time, the commoner species has been

brought to the Museum under the name of the venomous crotaline snakes, even the native Caribs being deceived by their appearance.

They are both terrestrial and arboreal, and are most frequently met with on the low stumps or the fallen trunks of trees, close to the riverside. In their movements they are the most rapid of all the boas, and they seem to be much less sluggish than their congeners. The commoner species has frequently been kept in the Museum cages, but without exception they have remained wild and untamed, if one may use the expression—in marked contrast to the other boas which under ordinary conditions can be handled with impunity.

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## *Among my Books.*

*By J. G. Cruickshank.*

I find my joy and my solace in literature. There is no gladness that his cannot increase, no sorrow that it cannot lessen.

PLINY'S LETTERS.



ONE of the advantages to the book-lover of a Colonial life, as compared with life in the Homeland, is the greater leisure he has for reading. Competition in the various departments of business being less keen, he is less engrossed in business cares and interests, and is thereby enabled to spend more of his time in the congenial companionship of his books. To him, their sweet society proves ample relaxation from the hardening and irritating influences of the street; and indeed it would be difficult to imagine any relaxation more complete, more refreshing, and more salutary. "The reading of books," says BARROW, "what is it but consulting with the wisest men of all ages and all conditions, who thereby communicate to us their most delicate thoughts, choicest notions, and best inventions, couched in good expression and digested in exact method?"

The most favourable time of the day for reading here is, I think, early in the morning when the house is quiet and street noises have not yet commenced. Then the mental energy, which, during the heat of the day is apt to become enervated, is strong and vigorous. CHAUCER in these early mornings is excellent company—the "profoundly simple CHAUCER" as LEIGH HUNT so aptly describes him. His child-like prattle as he leaps you



through dewy fields, white with daisies, is very soothing and refreshing, and coincides agreeably with the cool of the morning breeze. Rambling through his works the other day I came across a "complainte" which, in these times, many of us will tearfully endorse; it is called

A COMPLAINTE TO HIS PURSE.

Now voucheth safe this day ere it be night,  
That I of you the blissful sound may hear  
Or see your colour like the sonnē bright,  
That of yellowness haddē never peer.  
Ye be my life ! Ye be mine heartēs steer !  
Queen of comfort and goodē company !  
Beth heavy again or ellēs mote I die !

Conspicuous among the early writers, stands Sir PHILIP SIDNEY, of whom his friend SPENSER wrote :

To hear him speak, and sweetly smile,  
You were in Paradise the while.

His prose romance, "The Countess of Pembroke's Arcadia," so called on account of its dedication to his sister, for whose amusement it was partly written, abounds with rich gems of thought and fancy. Here is a beautiful description which will suggest to readers of SHAKESPEARE the opening lines of "Twelfth Night." "Her breath is more sweet than a gentle south-west wind, *which comes creeping over flowery fields and shadowed waters in the extreme heat of summer,*" and in the description of Arcadia we find "a shepherd's boy piping *as though he should never be old*"—surely a very suggestive phrase !

An ancient chronicler\*, referring to Sir WALTER RALEIGH, remarks, "He was a tall, handsome, and bold man, but his næve [blemish or weakness] was that he was damnable proud," and he tells us further on : "He

\* Minutes of Lives, by John Aubrey. Esq., 1680.

took a pipe of tobacco a little before he went to the scaffold, which some formall persons were scandalized at, but I think 'twas well and properly donne to settle his spirits."

Poor Sir WALTER leaves us the following verse as his last. It was composed on the night preceding his execution, October, 1618:—

Even such is Time, that takes on trust  
Our youth, our joys, our all we have  
And pays us but with age and dust;  
Who in the dark and silent grave,  
When we have wander'd all our ways,  
Shuts up the story of our days.

The rainy seasons take the place of winter to the book-lover out here. THOMSON in "The Seasons" has given us an admirable picture of the pleasures of the book-lover when "Winter, ruler of the inverted year" has arrived, and, in the words of EMERSON:

The housemates sit  
Around the radiant fire-place, enclosed  
In a tumultuous privacy of storm.

Here is THOMSON'S vignette:—

In the wild depths of Winter, while without  
The ceaseless winds blow ice, be my retreat

Where ruddy fire and beaming tapers join  
To cheer the gloom. There studious let me sit,  
And hold high converse with the Mighty Dead.

Here, in place of the snow whitening the air, and seeming "nowhere to alight," we have the torrential downpour of rain. The result, however, is similar. Both snow and rain drive us indoors to seek the company of our books, and indoors, whether by the "ruddy fire" or otherwise, we "hold high converse with the Mighty

Dead." There is something, I think, very delightful in this idea: that we are able at our pleasure to have intercourse with these brilliant figures in the field of literature. They are all there to minister to us in our every mood. We have them, and we have them at their best. "A good book," MILTON says in his "Areopagitica," "is the precious life-blood of a master-spirit, embalmed and treasured up on purpose to a life beyond life."

Of the English Essayists, LAMB holds the first place in my affections. There is a quaint, rich, delicate fancy in the writings of "The gentle Elia"—a charm of style which is delightful. His Essays, "The Praise of Chimney Sweepers," "Mackery End in Hertfordshire," "Poor Relations," "A Dissertation upon Roast Pig," and "The old Margate Hoy," are my favourites, while I have long entertained a very sincere regard for the memory of Mrs. SARAH BATTLE on account of her eminently sound opinions on whist. As a matter of fact, however, where all is good, distinction of this sort is invidious.

LEIGH HUNT's Essays charm by their delicate touches of fancy and imagination, and in perusing them we cannot fail to be struck by the wideness of his reading. I think it was LAMB, who said LEIGH HUNT wrote "Under the shadow of Books." LEIGH HUNT, we must observe, inherited Barbadian blood from his father.

The Essays of ADDISON, HAZLITT, and DE QUINCEY are favourites of mine: Among ADDISON's character sketches, commend me to "Ned Softly, the Poet" and "The Political Upholsterer" for gentle but effective satire. "Sir Roger de Coverley," the good old knight, will always live as an example of delicate portrayal of character.

"Of the making of many books, there is no end," and one of the disadvantages of the present tremendous outpour of books, I think, is that the older writers are apt to be neglected. Whether the new novel or the old novel, apart from the individuality of its author, possesses the most general interest, may perhaps be termed a debatable question. HAZLITT, in his Essay, "On reading new Books," admirably states the advantage accruing to the new book. "It appeals to our direct experience," he says, "and to well-known subjects; it is part and parcel of the World around us, and is drawn from the same source as our thoughts."

The objections to the old novel are many and various. It's "strange expressions," its prolixity, "those mellow old copper plates" with their "grôtesque figures" by CRUIKSHANK and others, its "general mustiness." The old novel, however, must always attract when one tires of the sameness and shallowness of the generality of present day work. "ALONSO of Aragon," MELCHIOR tells us, "was won't to say, in commendation of age, that age appeared to be best in these four things—wood to burn, wine to drink, friends to trust, and authors to read:" and GOLDSMITH takes up the same idea in "She stoops to conquer." Many of us, also, at the present day may be inclined to agree with the opinion of ALONSO of Aragon.

Besides the temptation to neglect the older writers, to which we are exposed by the flood of books now-a-days, there is the temptation to read superficially. We wish when asked the frequent question "Have you read So and So's new book," to be able to say "Yes," and to be able to express some sort of opinion on it. We wish to be

"up-to-date" in our reading, as in everything else, and in our endeavour to read all the "new" books, our reading is apt to become superficial, and being superficial is useless. In our flight through a book we have no time to observe its good points,—and it was the opinion of the elder PLINY that from the worst book you could get some good—just as we have no time to observe the beautiful bits of scenery which we may pass in a modern express train. Its skilful delineations of character, its descriptions of scenery, its polished phrases and neat expressions of thought and fancy—if it has any—are lost on us. We have no time to linger over its pages. Those books which deserve "chewing," "swallowing" or "digesting," (in the words of BACON), we have no time to chew, swallow, or digest. We only taste, and much tasting, besides cloying the palate, is apt to confuse the mind. As illustrating the little good derivable from the careless reading of many books, I may quote BULWER'S simile :—"A cottage flower gives honey to the bee ; a king's garden none to the butterfly." And SENECA, on "The Choice of Books," says, ". . . He is no where that is everywhere. They that pass their life in travel take up many inns, but entertain few friendships."

I have often envied those book-lovers who can enjoy the company of a book out-of-doors ; for I am not of their company. Like ELIA, "I cannot settle my spirits to it." COWPER in one of his charming letters, writing to Mr. UNWIN in his "favourite recess, the greenhouse," says :—"In such a situation, so silent, so shady, where no human foot is heard, and where only my myrtles presume to peep in at my window, you may suppose I have no interruption to complain of, and that my thoughts are

perfectly at my command. But the beauties of the spot are themselves an interruption, my attention being called upon by these very myrtles, by a double row of grass pinks, just beginning to blossom, and by a bed of beans already in bloom." And so I find it. Seated in the Botanic Gardens, for instance, I have tried to fix my attention on the pages of Elia or the Autocrat, but in vain. "The beauties of the spot are themselves an interruption." The rustle of the breeze in the trees, the flight of a bird, the passing of a wisp of cloud before the sun,—these all distract my thoughts. Nature seems determined that so long as her book is open before us, nothing else shall usurp our attention. So I pocket Elia and the Autocrat, and later on, wend my way home again.

"Poetry," in the words of SHELLEY, "is the record of the best and happiest moments of the happiest and best minds," and of all kinds of composition is that which gives the greatest and most enduring pleasure. It is, therefore, regrettable that it should be so little read now-a-days.

Here is a description of tropical scenery given in TENNYSON'S *Enoch Arden*, by the ship-wrecked sailor:—

The sunrise broken into scarlet shafts,  
Among the palms and ferns and precipices;  
The blaze upon the waters to the east,  
The blaze upon his island over head,  
Then the great stars that globed themselves in Heaven,  
The hollow-bellowing ocean, and again  
The scarlet shafts of sunrise—but no sail!

BROWNING'S well-known lines, composed while in Italy, will always appeal to those beyond the seas when Spring-time comes round:—

Oh! to be in England  
Now that April's there,  
And whoever wakes in England  
Sees, some morning, unaware,  
That the lowest boughs and the brush-wood sheaf  
Round the elm-tree bole are in tiny leaf,  
While the chaffinch sings in the orchard bough  
In England—now!

"To mind the inside of a book," says Lord FOPPINGTON in the *Relapse*, "is to entertain oneself with the forced product of another man's brain. Now, I think a man of quality and breeding may be much amused with the natural sprouts of his own."

Doubtless there are, at the present moment, many men "of quality and breeding" who derive an immense amount of amusement from "the natural sprouts" of their own brains. To those of us, however, who turn to our books for our entertainment, BARROW's words will appeal more forcibly than "this bright sally of His Lordship."

"He that loveth a book," says BARROW, "will never want a faithful friend, a wholesome counsellor, a cheerful companion, an effectual comforter. By study, by reading, by thinking, one may innocently divert and pleasantly entertain himself; as in all weathers, so in all fortunes."

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### *Occasional Note.*

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*Berbice Bats.*—Dr. C. G. YOUNG has kindly sent us the following :—

“ I have to add four more species to the list of bats from Berbice, already published in the Journal (*Timehri*, Vol. x, Part i.) ” :—

23.—*Saccopteryx bilineata* (New Amsterdam ; Plantation Providence). Guatemala ; Para.

24.—*Molossus nasutus* (New Amsterdam). Guatemala ; Brazil.

25.—*Noctilio mastivus* (Plantation Everton). Jamaica ; Brazil ; Ecuador.

26.—*Schizostoma minutum* (Berbice River). Brazil.

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## ***Report of Meetings of the Society.***

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***Meeting held July 8th.***—Prof. J. B. Harrison, M.A., &c., President, in the Chair.

Members present 8.

**Elections.**—*Associates*: Messrs. J. C. Pollard, P. McInroy, Philip Kingdon and G. E. Anderson.

The Honorary Secretary reported on behalf of the Directors that the timbers ordered from Mr. Ed. Seon had been brought to town and shipped per *S. Atlantis*. There were 10 logs Purpleheart, 4 Hoobooballi, and 2 Wamara, shipped on account of the Society and 5 logs Kabukalli, which had been rejected on examination, shipped on account of Mr. Seon. Messrs. W. Cunningham and J. J. Quelch had made a careful examination of the logs. He had written to Messrs. Foy, Morgan & Co., requesting them to dispose of the timbers to the best advantage and remit the proceeds. The Hoobooballi had been taken over at 9 cents per cubic foot and the Purpleheart and Wamara at 24c., the latter being the price agreed upon.

The Honorary Secretary also reported that the Directors had decided to discontinue the publication of *Timhri* after the end of the current year. The Journal had never paid, the losses amounting on an average to \$300 per annum, and then there were difficulties in getting it up and in keeping subscribers. The Directors proposed to have the Proceedings bound at regular intervals so that they might be available to the Members, who could always see them at the Rooms.

Mr. Hargreaves spoke of the desirability of getting the Proceedings printed half-yearly or annually.

The Secretary thought that as the originals would always be available, it would be hardly necessary to incur the expense of printing.

Mr. T. S. Hargreaves brought forward his motion, of which due notice had been given, for offering a premium for colony-grown and cured tobacco and cigars.

The mover said that he believed Mr. Mackay had intended to bring forward a similar motion but had been prevented by absence from the Colony. The matter had been brought before the Society some time ago, but the minor industries were not then thought of so much importance as they had become since the alarming fall in the market of the staple industry. More attention was now being paid to the subject and he thought the Society might approach the Government and ask for assistance so that a premium might be offered. He did not think the Society could afford to offer a sufficiently large premium, for a sum of \$10, \$15, or even \$50, would hardly lead to the production of a large sample, which would be necessary to solve the question as to whether tobacco growing and curing could be made an industry here. The premium should be large enough to induce planters and others to cultivate and manufacture on a sufficiently large scale to produce an article for export. Then, the particular wants of consumers had to be considered. Whereas the better classes could afford to pay for imported tobacco and cigars of good quality the labouring classes were more contented with what he believed was called by the trade "black fat," a very strong, luscious and

rank tobacco, which the President had told them at the last meeting was much adulterated. He thought an attempt should be made to prepare this quality, for it suited the taste of the people who consumed it. He thought that something might be done here as it was in Switzerland, where the peasants grew tobacco as they might cabbage and dried it in their houses. At certain times persons went round and bought this tobacco, which was cured and prepared at the factories.

Mr. Æneas D. Mackay seconded the motion. He had taken great interest in tobacco growing for some time past, and although \$50 had been given by a private person through the Society for an essay on the matter, he thought it still desirable that something further should be done.

Mr. Quelch spoke of the samples of tobacco shown at the previous meeting by the Hon. Mr. Jones and said that if a sufficiently large premium were offered it would probably induce people to take up the industry.

The President said they would be asking the Government to give a grant-in-aid of reducing the revenue, and Mr. Mackay in reply remarked that this might be also said of the assistance given to the rice industry.

Mr. Hargreaves said he did not think the Government would look upon the matter from that narrow point of view when they knew that the labouring man paid indirect taxation on everything he consumed, and that if they gave him work in growing tobacco, when otherwise he might be idle, he would contribute to the revenue. When the industry attained considerable proportions would be the time to think of a small tax, but not at the beginning.

The motion was carried.

The President's paper on the Agricultural Improvement of the Sugar Cane having been declared open for discussion, the President read a "Note on the arrangement of Sugar Cane Experiments."

There being no discussion, Mr. Æneas D. Mackay, proposed a vote of thanks, which was carried unanimously, for the "Note," and expressed his regret that the Agricultural members of the Society had not thought fit to attend and discuss the matter.

Mr. Hargreaves suggested that in view of the discontinuance of *Timehri*, the Directors might see their way to print the Proceedings of the Society, either half-yearly or annually, so as to form a continuous record for the information of the Members.

The President suggested that Mr. Hargreaves should give notice of motion so that the matter might be brought up at the next meeting and the opinion of the Members be obtained, to which Mr. Hargreaves agreed.

The thanks of the Society were accorded for the following donations:—

To the Library—from the Executors of the late C. C. Walker; "John Heminge and Henry Condell."

To the Museum—Iron concretions from Potaro, by Mr. W. Logan; antique snuffers, by Mrs. C. Fryer; old fire-arms, by Mr. J. P. Allt; crystallised egg, by Mr. H. Y. Delafons; a humming bird, by Sergt. Major McCurdy; a grison, by Mr. W. H. Bridges; a sloth, a labba, and insects, by Mr. G. S. Jenman; Indian curios and minerals from Canada, by Mr. Æneas D. Mackay; foetus of goat, by Mr. John Gibbs; twisted boat rope, by Mr. W. Seon; hairy caterpillar and

cassava smoothers, by Mr. R. T. A. Daly ; six Venezuela coins, by Mr. A. Pinaud ; a moth, by Mr. W. Van Eeden ; collared King Fisher, by Mr. R. Dodds ; vine caterpillar, by Mr. M. F. Monterro ; insects and fungi, by Mr. W. P. Kaufmann ; a sloth, by Mr. M. H. Bugle ; silver mohur or native Indian coin, by Mr. C. T. Blyth ; quartz and tungstate of lime from Omai by Dr. Lungwitz ; and a copper token from Mr. H. C. Harrell.

The meeting then terminated.

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*Meeting held August 12th.*—Prof. J. B. Harrison, M.A., &c., President, in the Chair.

Members present 13.

Electons.—*Associates* : Messrs. J. Wallbridge, H. G. Spain, H. E. Jordan, F. P. Stubbs, and H. E. Kent.

The following letter from Mr. H. Kirke was read :—

Victoria Law Courts,

2nd August, 1897.

Dear Sir,—As I am leaving the Colony I must place my resignation as a Director in the hands of the President. In doing so I wish to express how much I feel indebted to the R. A. & Com. Soc. ; I have derived the greatest benefit from it in many ways during my residence in the Colony and have always taken the greatest interest in its welfare. I feel it an honour to have been so often placed on the Directorate, and especially so when I was chosen in 1887 to be President of the Society.

Will you kindly convey to the President and Directors my best wishes for the continued prosperity of the Society.

I remain, Faithfully yours,

HENRY KIRKE,

Atg. J.

The Secretary reported that the Directors had decided to nominate Mr. Kirke as a Honorary Member; he would be balloted for at the next meeting. The vacancy in the Directorate had been filled by electing Mr. Jas. Gillespie.

Mr. Æneas D. Mackay moved that a hearty vote of thanks be accorded to Mr. Kirke for the great interest he had always taken in the welfare of the Society. This was seconded by Mr. A. R. Gilzean and carried unanimously.

The following report of the Committee of Correspondence was read:—

The Museum, Aug. 12, 1897.

R. T. A. Daly, Esq.,

Hon. Secy. R. A. & C. Society.

Sir,—I have the honour to report for the information of the Society, that arrangements are well advanced for the Horticultural and Poultry Show which is to be held on the 9th and 10th September. Meetings are being held in the country districts to give information about the Show and to stir up the interest of the people, and it seems likely that the Exhibition will be a successful one.

The Railway authorities, and the Sproston Dock and Foundry Company, have kindly promised to give free carriage for exhibits, from their various stations to Georgetown and back, and this will certainly largely benefit the Show.

I have &c.,

J. J. QUELCH,

Secretary.

In the absence of Mr. Hargreaves, who had written

to say he was unable to attend, his motion in regard to printing the proceedings of the Society was left over until next meeting.

Mr. Mackay called attention to the reported bacterium in so-called faulty rum, and the President stated that the matter was then under consideration by the Agricultural Committee and would be reported upon when the investigation was farther advanced. Up to the present however the results pointed strongly to the conclusion that the organism present was not the cause of the cloudiness.

The Secretary read the annexed letter from Mr. Edward Sutton:—

12th July, 1897.

Thos. Daly, Esq.,

Hon. Secy. R. A. & Com. Society.

Dear Sir,—I have the pleasure of acknowledging receipt of your letter of the 23rd June last, informing me of my having been unanimously elected an honorary member of your Society. I beg you will convey to the members my best thanks for this great and unmerited distinction, all the more highly esteemed from the fact of having been entirely unsolicited and totally unexpected, I trust I may regard it as an expression of appreciation of my humble efforts to contribute to the advancement of the cane sugar industry and of my steadfast desire to be useful in every possible way to that important interest. I have repeatedly received so much kindness and assistance in my work from gentlemen connected with British Guiana and the West Indies that it is an especial gratification to be more

closely associated with your interests by the very courteous action of your Society.

Yours, &c.,

EDWARD SUTTON.

The Secretary reported that he had received a letter from Messrs. Foy, Morgan & Co., intimating the arrival of the timbers ex *Atlantis* and speaking disparagingly of the inlaid tables which had been sent earlier.

The Secretary read the following letter from Mr. R. W. S. Mitchell; the sample of jute fibre therein referred to being laid on the table:—

Calcutta, 22nd June, 1897.

Sir,—I have sent you per Parcel Post, a small sample of Jute fibre, as it comes from the Ryat (cultivator.)

It is usual before shipping to cut off the roots, and take out hard bits, and make the fibre up into neat bundles before baling it for the English market.

If shipped "gross" it might be worth £9 0 0 to £10 0 0 per ton for a good style uncut. If cut and cleaned, it would be worth about £1 0 0 more. I am inclined to think, it would pay best to ship "gross," as the extra work required to clean and prepare it would probably cost more than one pound per ton. I am endeavouring to obtain information as to the weight of fibre per acre, which of course, is an important factor.

I have no doubt however that looking to the soil and splendid rainfall of the Colony, the Jute plant will grow much higher than in India.

The sample I send you comes, I believe, from North Bengal, and is longer than what grows near Calcutta.

Here, when the plant has reached some three or four feet, several inches of water over the ground appear to



be congenial to its growth, a condition of things fatal to all but aquatic plants.

Hence I opine that Jute should flourish splendidly in the abandoned front lands in the Colony.

I am, &c.,

ROBERT W. S. MITCHELL, C.M.G.,

Govt. Emigration Agent for British Guiana.

A Government letter covering another sample of the same fibre was taken for notification.

Mr. Jacob Conrad moved a vote of thanks to Mr. Mitchell for the interest he had taken in endeavouring to foster the minor agricultural products of the colony. This was seconded by Mr. Mackay and unanimously carried.

A Government communication referring to the import of Venezuelan timbers into Bordeaux was read and taken for notification.

Another Government communication, informing the Society that it had been placed on the free list for Indian Government Agricultural publications, was also read.

On the motion of Mr. Bellairs it was agreed that the Government Secretary be asked to convey the thanks of the Society to the Government of India.

A letter from Mr. D. Macgillivray, Tobago, enquiring into the method of sweating Liberian Coffee in Demerara, was referred to the Agricultural Committee, the President remarking that the information could be obtained from Mr. Chas Ross.

The following letter to the President from Sir John B. Lawes, a Honorary Member of the Society, was read and taken for notification :—

Rothamstead, St. Alban's,

June 25th, 1897.

Dear Sir,—I thank you very much for your reports upon the Sugar Cane, which are highly valuable as well as of great interest to myself. Many years ago, I was anxious to establish by direct experiment whether all the plants of the natural order Gramineæ derived all their nitrogen from nitric acid; of course my climate confined my experiments to grapes, wheat, barley and oats.

I was most anxious to carry out similar experiments on Sugar Cane and Rice, and for this purpose I acquired some land growing Sugar Cane in Queensland, but the dispute in relation to black labour prevented me from taking up these investigations. Your results are quite conclusive in regard to the Sugar Cane, and it is quite clear to me that all the Gramineæ family derive their nitrogen from nitric acid in the soil, and it is probable that this is the only source of their nitrogen, at all events in our experiments the measure of their growth is limited to the quantity of nitric acid which they can obtain from the soil.

The great difficulty to contend with in the application of ammonia and nitrates to the cane arises from the difficulty of keeping the land free from weeds; to turn nitric acid into organic nitrogen to become at some future time nitric acid again is a serious loss, and there can be no doubt that an unmanured wheat which is now growing its 54th crop in succession, and which still grows a crop equal to or perhaps more than the average crop of the world, is due to the fact that we keep the land free from weeds.

No amount of potash and phosphates can increase this unmanured crop, and a recent analysis of the soil several feet down shows that the nitric acid is very small and no more upon the mineral manured plot than upon the other. When ammonia and nitrates are applied, and where the crops of 40 to 50 bushels of wheat per acre are grown, we find considerable quantities of nitric acid over what we find where none is applied.

I think your Government has received a copy of our works and that they also receive a copy of our annual memorandum sheet. I have exhausted all the copies I have printed and I am binding up a few more copies to send out.

I take great interest in the Sugar Commission, but it is rather difficult to see what the remedy is against a Government which appears anxious to destroy all the sugar production in other countries and makes sugar artificially cheap to the great benefit of consumers in this country.

Yours truly,

(Sgd.) J. B. LAWES.

Printed copies of the Note on Sugar Cane Experiments\* having been laid on the table the President invited discussion on the matter.

Mr. Scard said he agreed with everything in the paper. It was most difficult to find uniformity in fields of any size, and even in the experiments of the Colonial Company there were great differences in some parts as compared with others. Professor Harrison had practically arrived at the same results at the Botanic Gardens as the Company had on their estates.

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\* See Page 147 *ante*.

Mr. Jacob Conrad expressed his regret at the want of interest shewn by the planters in this matter, and Mr. S. Vyle spoke of the discouraging effect of the same thing on persons who might otherwise be induced to read papers.

Mr. Bellairs thought that an ordinary planter could hardly be expected to criticise such a paper. Instead of a slight to Professor Harrison, the absence of discussion was rather a compliment.

The thanks of the Society were accorded for the following donations :

To the Library—Portrait of the Earl of Derby, from Mr. L. M. Hill ; 38 nos. of the *Sugar Cane*, from Mr. W. R. Spence ; 2 books and 3 pamphlets, from the U. S. Department of Agriculture.

To the Museum—Two insect nests, by Mr. G. F. Franks ; clay model of Brahmin Bull, by Mr. W. Watson ; skin of water camoodie, by Mr. Thomas Garnett ; Grass moths otter, and wood stump, by Mr. G. S. Jenman ; Moths and twisted bush rope, by Mr. A. Gordon ; snakes in spirit and an owl, by Inspector Baker ; small snake from orchid, by Mr. J. A. Barclay ; a parroquet, by Mr. T. S. Hargreaves ; a Highland drinking cup, toddy ladles, snuff-horn and cup and powder flask, by Mr. Æneas D. Mackay ; abnormal egg of Guinea bird, by Mrs. Mackay ; branching zoophyte, by Mr. John Junor ; phosphatic nodule by Professor Harrison ; a snake, by Mr. J. Springer ; pottery and dolerite, by Mr. C. W. Anderson ; a greenlet by Mr. C. A. Lloyd ; eggs of Lovebird, by Mrs. Laurence ; skin of bushmaster, by Mr. H. H. Bagnell ; seeds of *Ormosia*, by Mr. J. Rodway ; Carib necklace pendant, by Mr. Harold Swan ; pupa of cocoanut root boring beetle, by Mr. H. C. Menzies ; 3

eggs of mahooka, by Mr. C. A. Parrett; Guiana silk moth, by Mr. J. Conrad; local Jubilee medal, by Mr. L. M. Hill; spiny spider, by Mr. N. G. Hohenkerk, and young alligator, by Mr. R. Phillips.

The Assistant Secretary exhibited two plants of jute (*Corchorus capsularis* and *C. olitorius*) which he had grown in his garden, but which however were very poor specimens as far as height and size were concerned.

Mr. Quelch announced that at the coming Horticultural Show, Professor Harrison had offered prizes of \$5 each, to artisans and labourers residing in East Demerara, West Demerara, Berbice and Essequibo, including the Pomeroon and North West District, for the best collective exhibits. He, Mr. Quelch, hoped that other gentlemen would also come forward with similar offers.

The meeting then terminated.

*Meeting held October 14th.*—Sir Cavendish Boyle, K.C.M.G., Vice-President, in the Chair.

Members present 9.

Elections.—*Members*: Ven. Archdeacon Gwyther, M.A. and Mr. F. A. Gall.

*Associates*: Messrs. M. Widdowson, L. C. Carter, E. B. Stubbs, P. L. Wingrove, F. J. Smith, Donald Mitchell, Robert Craigen and E. Slater Franker.

The Secretary read a letter from Prof. J. B. Harrison, the President, asking the members to excuse his non-attendance on account of unavoidable absence in the North-West District.

On the proposition of Mr. H. Kirke as an Honorary Member, of which due notice had been given, the Secretary stated that it was hardly necessary to say anything

in favour of Mr. Kirke, but he would state that his connection with the Society dated from November 5th, 1872, that he was elected on the Book Committee almost immediately afterwards, that he became a Managing Director in 1875 and was President for 1887. He had always taken a deep interest in the Society and was a regular attendant at the Meetings.

The Chairman said he wished that the meeting was larger, but he was quite sure that however large the attendance everyone would agree with the proposal for Mr. Kirke's election. They had lost a most useful man, and they could do no less than elect him an Honorary Member.

Mr. Kirke was unanimously elected.

The annexed Report of the Agricultural Committee was read :—

Georgetown, Oct. 13th, 1897.

To the President and Members of the

R. A. & C. Society.

Gentlemen,—On behalf of the Agricultural Committee of the Society, I have the honour to report that the letter of Mr. D. Macgillivray of Tobago, referred to the Committee at the last General meeting of the Society, has been considered, with the result that the information requested has been kindly furnished by Mr. Charles Ross, a copy of whose letter is annexed, together with portions of the samples therein referred to.

I have also to report, that, to prevent delay, a copy of the letter and portions of the samples have been forwarded per Mail to Mr. Macgillivray.

I have, &c.

S. BELLAIRS,

Hon. Secretary, Agricultural Committee.

Land of Canaan, D. R.,  
22nd September, 1897.

S. Bellairs, Esq., Hon. Secretary,  
Agricultural Committee, Georgetown.

Dear Sir,—Your letter of the 15th instant, along with copy of letter from Mr. Macgillivray, reached me on the 20th instant, and I now have much pleasure in sending the information desired by your Committee.

To procure a good sample of Liberian Coffee, sweating is absolutely necessary.

The berries must be fully ripe before they are taken from the trees.

If the weather is wet, the berries as they are taken from the trees, may be made up in heaps in some shaded part of the field. Each heap should not be less than three feet high by 5 feet wide. The berries so heaped should be covered with plantain leaves and allowed to remain from 4 to 5 weeks, by which time the pulp should be black and soft, and the sweating is then completed. The pulp should be washed off and the berries dried and prepared for use.

If the weather is dry, the berries should be taken from the field and placed under cover and the heaps watered and covered with plantain leaves. The heaps should be watered every second day, with a watering pot, the same as used for garden work ; heavy watering will injure the sample of the berries.

After fermentation has fully commenced, the watering should be stopped but the berries must be kept covered until the sweating is completed.

I will send for the inspection of your Committee the following samples :—

Berries as taken from the trees.

Berries with the sweating completed.

Berries washed after sweating.

Berries dried and prepared for use.

Hoping the above will furnish the information desired,

I am, &c.,

(Signed) C. ROSS.

The Honorary Secretary called attention to the statement that the Secretary of the Agricultural Committee had communicated direct with M. Macgillivray, which he, Mr. Daly, thought was hardly right, as all communications should pass through the Secretary of the Society.

Mr. L. M. Hill supported the Hon. Secretary.

The Hon. B. Howell Jones, Chairman of the Agricultural Committee, stated that he had thought it desirable that the specimens should go by the outgoing Mail as some of them were rotting.

The Honorary Secretary said if the matter had been communicated to him he would have sent them off, after consulting with the President, so that there would have been no delay.

It was agreed that in future the course indicated by the Honorary Secretary should be pursued.

Mr. Hargreaves not being present, his motion in regard to publishing the Proceedings, was laid over.

The following Government communication in reference to jute &c. in India, was read and ordered to be brought up for discussion at the next meeting :—

Government Secretary's Office,

Georgetown, Demerara,

13th August, 1897.

Sir,—I have the honour by direction of the Governor



to transmit for the information of the Royal Agricultural and Commercial Society, a letter from Mr. Mitchell, Emigration Agent for British Guiana at Calcutta, on the subject of Jute cultivation, and to request the favour of its return when perused.

I have, &c.,

CHARLES T. COX.

The Honorary Secretary,

Royal Agricultural and Commercial Society.

Government Emigration Office,

21, Garden Reach,

Calcutta, 12th June, 1897.

Sir,—In continuation of previous reports on the cultivation of Jute, I have the honour to submit, for the information of His Excellency the Governor, the following extract from the Calcutta *Englishman* of 3rd inst., shewing in tabular form the chief exports of Indian produce to foreign countries.

#### EXPORTS.

The more important exports of Indian produce to foreign countries from Calcutta during the past year were:—

|                    | 1894-5.        | 1895-6.     | 1896-7.     |
|--------------------|----------------|-------------|-------------|
|                    | Rs.            | Rs.         | Rs.         |
| Jute raw           | ...9,89,89,311 | 9,27,61,410 | 9,96,51,492 |
| Tea ...            | ...7,11,57,590 | 7,15,63,397 | 7,72,69,736 |
| Jute manufactures. | 4,13,71,689    | 4,66,55,943 | 5,15,28,978 |
| Opium              | ...5,29,68,740 | 5,04,63,935 | 4,96,87,235 |
| Dyeing & Tanning   |                |             |             |
| Materials          | ...3,57,94,559 | 3,79,93,613 | 3,14,71,634 |
| Hides and Skins    | ...2,72,63,795 | 3,12,75,285 | 2,85,60,259 |

|                      | 1894-5.<br>Rs. | 1895-6.<br>Rs. | 1896-7.<br>Rs. |
|----------------------|----------------|----------------|----------------|
| Grain and Pulse...   | 3,90,07,226    | 4,01,99,194    | 2,72,93,146    |
| Seeds ...            | 3,55,78,463    | 2,37,30,992    | 2,26,54,539    |
| Lac ...              | 1,39,57,703    | 1,83,00,615    | 1,38,55,530    |
| Saltpetre ...        | 40,80,063      | 53,10,426      | 56,06,687      |
| Cotton raw ...       | 43,15,840      | 97,03,885      | 82,20,501      |
| „ twist and yarn     | 23,95,599      | 25,70,204      | 53,84,853      |
| Silk raw ...         | 48,24,330      | 61,67,336      | 49,50,709      |
| Oil ...              | 24,24,847      | 21,12,272      | 25,87,060      |
| Silk manufactures    | 11,03,079      | 12,39,776      | 11,51,135      |
| Manures ...          | 10,37,311      | 11,35,185      | 11,10,336      |
| Wool manufactures... | 6,18,729       | 9,08,027       | 10,75,938      |
| „ raw ...            | 11,95,543      | 10,53,570      | 8,96,959       |
| Sugar ...            | 2,87,413       | 28,746         | 1,84,627       |

It will be observed that notwithstanding the immense impetus of late years given to the Tea industry, the export of Jute considerably exceeds it, while that of sugar is the smallest of all.

I think the climate and soil of British Guiana will be found well adapted to the cultivation of Jute.

There is no reason why it should not become eventually one of the staple exports, not in competition with sugar, but as a valuable adjunct in years of extreme depression of the major industry.

There is ample room on most estates in the Colony for the cultivation both of Cane and Jute.

In India it has been found to pay better than cane, not only through the depression in Sugar consequent on the intrusion of bounty fed German Beet Sugar, but because of the facilities it offers for cultivation and manipulation.

Some time ago, I sent a small quantity of Jute seed to the Colony, but learned with regret, that it had failed to germinate. I at once procured some fresh seed, and after satisfying myself by actual experiment that it would grow, I sent about two pounds to the Colony carefully packed in tin.

Shortly after, Mr. Goolmohamed, who frequently visits India on trading expeditions, called at this office, and was good enough to consent to take charge of some more seed. I thought the opportunity too good to be neglected, and at once procured about a maund (82 lbs.) of fresh seed. There was no time, however, to pack it in tin, but Mr. Goolmohamed promised to keep it in his cabin packed in double gunny bags.

Hitherto the Colony of Mauritius has enjoyed a fair amount of prosperity owing to the outlet for its sugar afforded by Bombay and Australia. "Nemesis," however, in the shape of large consignments of German Beet Sugar, has practically closed the Bombay Mart, and the extension of Sugar cultivation in Queensland on the co-operative system, has had a similar effect in Australia.

I annex an extract from the same article on this subject.

"Imports from Mauritius may be said to be confined to sugar. For the last five years the figures were:

|                           |             | Cwt.    | Rs.       |
|---------------------------|-------------|---------|-----------|
| Refined and Unrefined ... | 1892-93     | 139,173 | 7,62,911  |
| Ditto ...                 | ... 1893-94 | 171,547 | 13,91,210 |
| Ditto ...                 | ... 1894-95 | 382,216 | 27,42,042 |
| Ditto ...                 | ... 1895-96 | 317,072 | 17,61,096 |
| Ditto ...                 | ... 1896-97 | 338,146 | 22,85,125 |

More refined and less unrefined sugar was received in

the past year. The trade in this staple has been affected by the enhanced sugar bounties of Germany. The effect of the bounty has been to materially lower the cost of beet sugar, and, assisted by a higher and steadier exchange, it has enabled the German manufacturer to place his sugar on the Indian Market at a rate with which Mauritius cannot compete. The planters have, therefore petitioned the Home Government to come to their relief. The total import of cane sugar from Mauritius into all India during the past year advanced by 94,852 cwt., and this, combined with a certain heavy deficit in the outturn from Cuba, should furnish some relief to the island."

The price of Jute, is I believe about the same as ordinary refined sugar, about £12 per ton. I hope to send samples of the fibre to the Colony shortly.

I have ascertained by enquiry that some varieties of Jute can be got to grow successfully on high ground, but the plant thrives best on low lying lands.

The ground should be thoroughly prepared as for other cultivation, when the seed may be sown broadcast, and after the plants have attained a few inches in height, they are thinned out to five or six inches apart and soon cover the ground to the exclusion of any other growth. The cultivation is therefore simple and by no means costly.

I have made several attempts to obtain a treatise on the cultivation of the plant, but unsuccessfully hitherto; the only article being one contained in a voluminous report to Government on fibres generally and to which I have not yet obtained access.

The cultivation of the plant and preparation of the

fibre are, however, of so simple a nature, that a work on the subject is scarcely needed.

No doubt there are many old emigrants in the Colony, especially Bengalis, who are familiar with the cultivation of the plant and the extraction of the fibre.

In India the cultivation is carried on almost entirely by natives, on farms of small extent, where the plant is grown and the fibre prepared on the spot, and sold to Agents, who bale and transmit the produce to Calcutta, in many instances several hundred miles by boat or rail.

I have, &c.,

(Sgd) ROBERT W. S. MITCHELL, C.M.G.,  
Govt. Emigration Agent for British Guiana.

Another Government communication, covering a Report on the Agricultural Capabilities of Dominica was also read, and the Report ordered to be laid upon the table.

The following Government letter was also read :—

Government Secretary's Office,  
Georgetown, Demerara,  
14th August, 1897.

Sir,—I have the honour by direction of the Governor to enclose herewith for the information of the Royal Agricultural and Commercial Society, a copy of a resolution by the St. Marylebone Vestry on the subject of obtaining material for wood paving from within the British Empire, which has been received from the Secretary of State for the Colonies.

I have, &c.,

CHARLES T. COX.

The Secretary

Royal Agricultural  
and Commercial Society.

42, Welbeck Street,  
Cavendish Square, W.,

June 21st, 1879.

Sir,—I have the honour to submit the following resolution which was passed unanimously at the last meeting of the St. Marylebone Vestry on June 17th.

*Resolution* :—Proposed by Ernest Snape, M.D. ; seconded by H. G. Slade, F.R.G.S. and F.R.C.I.

That it be an instruction to the Works Committee to avail themselves of the present unique opportunity when so many Colonials, Officials and others are in London, to confer with those interested to ascertain whether it is not possible to obtain equally serviceable material for wood paving within the British Empire as that now obtained from Foreigners. Carried unanimously.

The matter is urgent, but if this resolution was placed before the proper people, I think something might be done.

(Sd) ERNEST SNAPE, M.D.

The Right Honourable

J. Chamberlain, M.P.

Colonial Office.

Mr. L. M. Hill said that Mora would be excellent for paving, but the drawback was the difficulty of procuring it cheap enough to compete with Australian woods.

Mr. Messer said he had taken some trouble about the matter when in England and it seemed to him that the proper persons to communicate with in England were the timber merchants rather than the Colonial Agents. The trade in Jarrah from Australia was so great and the capital invested so much, that he thought it would be a long time before there would be any chance of competing with it.

The Chairman said he had gone into the matter, and had come to the conclusion that unless it could be proven that Mora lasted three times as long as Jarrah it was useless to attempt to compete. The only means of proving this would be by laying down a sufficiently large pavement. What he understood that the Marylebone Vestry wanted was blocks cut and ready to put down, but he doubted whether anyone in the Colony was prepared to do such a work. Samples might be sent but it would never do to lead these people to believe that they could supply the blocks in quantity if it could not be done.

Mr. L. M. Hill thought that, as foreign countries were mentioned, perhaps Norway pine was meant, and possibly some of the softer woods of the colony might do.

Mr. Conyers thought the timber merchants were the proper parties to take up the matter, and that the discussion when published might lead to their doing so.

The Chairman thought it would be sufficient if it were made known that the Society would be happy to be the medium of communication between the timber merchants here and at home.

The Secretary informed the meeting that he had also received from the Government a copy of the Blue Book on the trade of the British Empire.

On the motion of Mr. L. M. Hill, seconded by Mr. Jacob Conrad, a general vote of thanks to the Government for the communications and papers sent was accorded.

The Secretary read the following letter in reference to the trial shipment of timbers:—


104 & 105, Bishopsgate Street Within,

London, E.C., 24th August, 1897.

R. A. & C. Society of British Guiana,  
Georgetown.

Dear Sir,—We enclose copy of our letter of the 27th July, and are in receipt of your favour of the 20th July with specifications of the shipment *ex Atlantis*. It is always advisable to send specifications, although in the present case the omission did not retard the sale, as it was necessary for the wood to be inspected before business could be arranged :—

*Ex Atlantis*  $\frac{11}{16}$ .—The Dock Co's. measurements are :

|   |                       |            |             |
|---|-----------------------|------------|-------------|
|  | P 10 Logs Purpleheart | = 645      | cubic feet. |
| "   | H 4 " Hoobaballi      | = 147      | "           |
| "   | W 2 " Wamara          | = 116      | "           |
| "   | K 5 " Kabukalli       | = 289      | "           |
|   | <hr/> 21 Logs Total   | <hr/> 1197 | <hr/> "     |

These measurement accounts were received from the Dock Co. on the 21st inst. We have inspected the goods and report as follows :—

*10 Logs Purpleheart.*—These are a very fair lot, but some of them should have been made more square. Two of the longest logs are nearly round at the small end. We have sold the 10 logs at  $\frac{3}{6}$  c. ft., landed terms as per contract enclosed.

*11 Logs various Woods.*—These are not very favourable specimens, most of the logs are nearly round, instead of being made square, and all have a great amount of sap wood, which should be hewn off. We have shewn



these logs to some of our buyers, but none of them care to make an offer at present, as they do not see what the wood can be used for. None of these woods appear to be similar to the samples our buyers suggested should be sent, but we will do our best to dispose of them,

Yours very truly,

FOY, MORGAN & CO.

The Secretary said that this sale would probably pay the cost of all the timbers.

Mr. L. M. Hill said he was sorry to see the remark about the squaring of the timber, but it agreed with his experience of the carelessness of the woodcutters of to-day.

Mr. W. Cunningham said that in reporting on these timbers before shipment he had said that the squaring was not very good, but as the logs fairly represented what they were prepared to supply he allowed them to pass.

In reference to the inlaid tables, which were before the meeting, the Secretary reported that after the adverse report of Messrs. Foy, Morgan & Co. the Directors had got them returned through Mr. Nevile Lubbock, the Resident Director in London. Mr. Cunningham had seen the tables unpacked and had sent the following letter :—

Georgetown, Demerara, 14th October, 1897.

Thomas Daly, Esqr.,

Hon. Secy., R. A. & C. Society.

Sir,—In accordance with the request contained in yours of the 12th inst., I inspected the two tables returned from Messrs. Foy, Morgan & Co., and I am pleased to say that they appear to be in fair order with the exception of a little shrinkage, which caused the centres to bulge

out which any cabinet maker could have put right in an hour or two, we found the screws and turnings of these tables tied up as we sent them, and it is our opinion that these parties never took the trouble to set up the tables, so could form no correct idea of what the tables were.

The tables are herewith sent back and members may judge for themselves as to the truth of the statements made. We certainly think for the good name of the workmen of this Colony they should be refuted by the Society.

I am, &c.,

WILLIAM CUNNINGHAM.

The Secretary said the tables, which cost \$70.00, were now left on their hands.

Mr. W. Cunningham said he did not think the Society would lose anything by them. He would be willing to sell them for the Society if they wished; he was certain he could find a market for them.

It was decided to let them remain in the Rooms for a time, when, after consideration, the Directors might take advantage of Mr. Cunningham's offer.

The thanks of the Society were accorded for the following donations:—

To the Library—from Dr. Jos. Simms, *Physiognomy Illustrated*; from Albert M. Kerr, Photo of Society's Buildings.

The meeting then terminated.

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*Meeting held November 11th.*—Professor J. B. Harrison, M.A., &c., President in the Chair.

Members present 8.

Election.—*Associate*: Mr. A. A. Cummings.

The following report of the Committee of Correspondence was read and adopted:—

The Museum, November 11, 1897.

R. T. A. Daly, Esq.,

Hon. Secy., R. A. & C. Society.

Sir,—I have the honour by direction of the Committee of Correspondence to forward herewith a report on the Horticultural and Poultry Show, 1897, for the information of the Society. The Committee regret that, owing to unavoidable circumstances, the report has been so long delayed.

I have, &c.,

J. J. QUELCH,

Hon. Secretary.

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REPORT ON THE HORTICULTURAL SHOW, 1897.

The Committee have the honour to report that the Horticultural and Poultry Show, held on the 9th and 10th September, was a pronounced success both as regards the number of exhibits, and the general attendance of visitors; and from an exhibition point of view, the arrangements worked much more smoothly and efficiently than in previous shows. The adoption of the various suggestions made by last year's Committee contributed a good deal to this end; and there can be no doubt that the experience gained each year tends largely to promote the efficiency of succeeding ventures.

The most striking feature of the exhibition was undoubtedly the great preponderance of the artisan exhi-

bits, more especially in the classes of Fruits, Vegetables and Economic Products. The artisan exhibitors not only took full advantage of the sections reserved for them, but contributed the great bulk of the exhibits in the open sections, and carried off the greater number of prizes. The Society thus has the satisfaction of knowing that these Shows are benefiting the very class aimed at, and that year by year a wider interest is being aroused among the people. The addresses given by various members of the Committee in the village districts, to make known the objects, and to explain the various conditions of the Show, have tended largely to popularise it, and its advantages are being more clearly recognised.

It is worthy of remark that a very large proportion of the exhibits came from the West Bank, Demerara, the villages along Canals No. 1 and No. 2, Stanley Town, and Bagotville, and Good Intent and Sisters, being far ahead of any others in the Colony. The East Bank, and the East Coast, Demerara, particularly Golden Grove and Buxton, were also fairly represented. It is to be regretted, however, that many large districts within convenient reach of town were almost entirely unrepresented, in spite of the facilities so kindly given by the Directors of the railway and the Sproston Dock and Foundry Company, in the free carriage of exhibits to and from all their stations.

It is pleasing to note that the great increase in the number of exhibits shewn in 1896 has been well maintained in 1897. A comparison of the returns for the five years 1893-1897, in the various classes, very clearly illustrates the growth of the Shows, as may be seen from the following table :

|          |                    | 1893. | 1894. | 1895. | 1896. | 1897. |
|----------|--------------------|-------|-------|-------|-------|-------|
| Class A. | Plants ...         | 37    | 108   | 135   | 390   | 373   |
| „        | B. Flowers, etc... | 39    | 47    | 45    | 69    | 47    |
| „        | C. Fruit ...       | 74    | 168   | 105   | 271   | 541   |
| „        | D. Vegetables ...  | 80    | 172   | 125   | 271   | 552   |
| „        | E. Econ. Products  | —     | 84    | 71    | 298   | 479   |
| „        | F. Miscellaneous.. | 5     | 17    | 12    | 30    | 7     |
| „        | G. Poultry ...     | —     | —     | 42    | 96    | 87    |
|          | Totals ...         | 235   | 596   | 535   | 1,425 | 2,086 |

To still further illustrate the difference in the amount of material which has now to be entered, arranged and judged, in comparison with earlier Shows, it is sufficient to point out that the exhibits in each of the two classes of Fruits and Vegetables, in 1897, more than exceeded the total number of the whole Show two years ago.

The entries under different heads were in many cases very numerous, there being for instance 123 under sweet and bitter cassava, 97 for starches, and 76 for limes. In the great classes of fruit, vegetables and economic products, the chief competition took place under bananas, pines, guavas, sweet and seville oranges, pomaloes, limes, shaddocks, cocoanuts, plantains, yams, sweet and bitter cassava, tannias, ochroes, peppers, cornmeal, plantain meal, cassava meal and starches there being little—in some cases none—under pumpkins, cucumbers, vegetable marrow, radishes, lettuce, celery salads, cabbage, watercress, shallots, citrons, grapes, melons, custard apples, star-apples, cocoa, kola, rice, Liberian coffee, vanilla, tobacco, black pepper, pimento, ginger, chutnee, bees wax and crushed feed. Under a few heads, such as grapes, chutnee and crushed feed, there was not even a single entry.

By the adoption this year of the principle of a larger number of smaller prizes, and of extra prizes, even of small value, much greater satisfaction has been caused, more especially where, owing to numerous entries, many exhibits were deserving of recognition over and above the number specified in the prize-list. As will be seen from the detailed statement attached, 274 persons took prizes, varying in amount from one shilling to one hundred and six shillings, the aggregate being \$546 96, thus considerably exceeding the Government vote.

The opening of the Show for a second day, at a lower rate, proved to be a great success; and in fact the gate-money thus gained becomes a necessity for the defrayal of the increased expenditure due to the extension of the Show. The Government vote remains stationary; the prize-list steadily increases; and the expenses of running the Show are very considerably increased, year by year, owing to the larger number of exhibits. It is to be noted that owing to this additional gate-money, but a small part (\$78 23) of the \$300—guaranteed by the Society, has been required, in spite of the fact that the prize-list had been extended on the strength of this guarantee, and that forty-eight wire coops with fittings for poultry, and a large amount of extra material for sheds, and other fittings, had to be provided, all of which remain as assets of the Committee.

Experience of the last two Shows makes it advisable to limit the times for the making of entries. In the earlier exhibitions when there was but a comparatively small number of exhibits, it was possible to receive entries even on the day of the Show; this year the time for entries was closed the day before; but for the proper

accommodation, arrangement and judging of the large mass of material now exhibited, it is desirable that still further limitation be made, the day before being reserved purely for the receipt and arrangement of exhibits.

Interesting non-competitive features of this year's Show, were the excellent floral and decorative, exhibits of the Ice Factory, and the pottery making, with the potter's wheel, of the Vreed-en-Rust Pottery works, Demerara River—both of which attracted very great attention.

Special mention must here be made, too, of the ornamental and economic exhibit of the Botanic Gardens, designed as an object lesson for the proper staging of plants for show purposes—an exhibit that not only attracted a great deal of attention, but was calculated to be of considerable public benefit.

The Committee beg to express their appreciation of the kindness of His Excellency the Governor in opening the Show, and in lending the Government House Marquee as a Committee's tent. They are glad to report also that the services of the Police were obtained free during the time when the grounds were opened to the public, and that the Militia Band<sup>d</sup> was allowed to play on the afternoon of the first day, both of which caused a considerable saving of expenditure to the Committee. The very efficient service of the Police, not only in the keeping of order, but in the guarding of the exhibits, both by day and night, throughout the whole time of the Show, is worthy of special mention.

The Committee would make acknowledgment to the Mayor and Town Council for permission to use the Promenade Gardens; to the Directors of the Railway for

free carriage of exhibits to and from all their stations, for granting cheap return tickets on both days, for running a special evening train on the first day, and for the loan of tarpaulins; to the Sproston Dock and Foundry Company for free carriage of exhibits and for the running of a late ferry steamer on the first day; and to Messrs. Booker Bros. for the loan of tarpaulins—all of which so largely conduced to the success of the Show.

The Committee desire to record the giving of special prizes by Prof. J. B. Harrison, the President of the Society, five dollars being offered for the best collective artisan exhibits from Berbice, East Demerara, West Demerara and Essequibo; also of the receipt of \$2.16 from Mrs. Seedorff, being half-prize money returned to the Committee for the encouragement of artisan exhibitors.

The Committee were largely indebted to the Press for many free notices of the Show, which helped to keep it constantly before the public; and also to many persons, in the country districts especially, who worked to promote a healthy interest in these annual exhibitions. Special thanks, indeed, are due to Mr. H. J. Gladwin of the East Coast, who undertook all the duties of local Secretary in that district, and thus materially lightened the work of the general Secretary.

The following gentlemen kindly acted as Judges of the various Classes; Mr. G. S. Jenman and Mr. R. Ward for Classes A and B; Mr. A. R. Gilzean and Mr. J. Rodway for Class C; Mr. John Junor and Mr. W. T. Binnie for Class D; Hon. B. Howell Jones and Prof. J. B. Harrison for Classes E and F; and Mr. G. B. Steele for Class G. The Committee as a body acted as Judges



of the Botanic Gardens Exhibit, Mr. T. S. Hargreaves kindly summarising the results of the judgment. The Dinner Table Decorations were judged by ballot among the visitors who attended the Show during the first hour of opening, each being furnished with a ticket on which was to be written the number of the table that was considered the best.

Special duties were undertaken by the following members of the Committee :—Mr. L. M. Hill, a Sub-Committee for Sheds; Mr. S. Vyle, Sub-Committee for Illuminations; Dr. Ford and Mr. Gilzean for Refreshments; Mr. Æ. D. Mackay and F. I. Scard for Gates and Admissions; Mr. S. M. Bellairs, Mr. J. B. Woolford and Rev. D. J. Reynolds in charge of No. 2 Tent; and Mr. T. S. Hargreaves in charge of the Committee's Tent.

Several suggestions have been made by various members of the Committee for the further improvement of the Horticultural Shows; and these have been recorded in the minutes of the Committee for consideration next year; but in view of the pronounced success of these exhibitions, and their public utility, and the desirability of beginning arrangements in good time, the present Committee would urge upon the Society that an early application be made to the Government for the usual grant of five hundred dollars (\$500) towards the prize-list of the Show for 1898.

Reports by the various Judges on the different classes of the Exhibition, together with a statement of expenditure, are herewith attached for the information of the Society.

J. J. QUELCH,

Hon. Secy. of the Committee of Correspondence.

**REPORT ON THE RECENT HORTICULTURAL SHOW, WITH  
SUGGESTIONS FOR THE IMPROVEMENT OF FUTURE  
SHOWS, BY G. S. JENMAN, F.L.S.**

Except for the overcrowding of exhibits, which occurred in the Economic Division, of which I shall speak presently, the arrangements provided for the Horticultural and Poultry Show, I think, were as convenient and accommodating to the several and varying needs of the Exhibition as the circumstances and conditions required, leaving very little, and this in minor details only, that one could suggest in the way of criticism for improvements in the future.

The plant and flower shed was large enough for the purpose,—for the large plants of crotons, palms &c., shown every year, are seen to much greater advantage arranged on the turf around the outside of the building, which they set off and give a necessary finish to, than they would be inside the building. The whole of the inside should be kept, as now, exclusively for flowers, ferns, orchids and other of the smaller sized subjects exhibited. One small improvement that would entail no extra expense, which I mentioned last year, is very necessary in the accommodation of the plants and flowers inside; that is that the staging be considerably lowered. The steps of the staging arising from the benches should not be more than a few inches above each other. This would allow the plants or flowers to be seen to the best advantage, while the pots, tubs, buckets, &c., would be almost concealed. No other system of staging could be adapted so adopted to make everything so unsightly as the present one, under which all the varying kinds of vessels used are exposed to full view, standing in isolated

lines, away up above and clear of each other, with the evening sun shining through the open spaces between them, revealing their heterogeneous character and naked outlines. As to the quality of the material exhibited at the past Show—there was much difference and variety in worth, a small minority of the exhibits being good, evidencing care and interest on the part of the exhibitors in their cultivation and form of presentation. Where these instances can be singled out, higher prizes might be given them, as a recognition of their merits, and the interest taken by the cultivators in their growth &c. The great bulk of the stuff, however was poor, much of it not fit for room on the benches and tables, and clearly indicating that it had not been cultivated at all, but just left to nature to grow, to be used for show purposes when required. From this point of view, and to encourage the good exhibits and discourage the poor and worthless, I would, using reasonable consideration of course, recommend a stringent curtailment of the liberality with which prizes are now given. My opinion is that this generosity does not encourage the exhibitor to grow or prepare better stuff, but the very reverse of it—it induces him to take little or no trouble at all, believing that whatever he may put on the table the chances are it will secure him a prize.

In the observance of rules for the guidance of exhibitors an initial step in advance was made this year, in the passing over without comment certain exhibits which failed to conform to the conditions laid down in the prize list of the character and limits of size of the vessels used for the plants shown in particular groups or single plants. I am confident this firmness had a salutary effect on the

exhibitors, who thus failed, after all their trouble, to have the merits of their exhibits judged. This good educational beginning should be maintained, for it will make intending exhibitors much more careful than they appear to be now in reading their catalogue, and attentive to the disqualifications for non-conformity with the conditions (of all kinds) in cases where conditions are prescribed. Besides not giving prizes to inferior material, that which is obviously bad, all plants lifted from the ground for the occasion, should be rejected at the staging, and removal from the Exhibition grounds insisted on. These disciplinary aids in the education of exhibitors, or would-be exhibitors, would I think in time have a beneficial effect, and, once they got to realise the absolute necessity of conformity, the rules would be carefully observed by them. The Artisans' and Labourers' exhibits, taken on the whole, were commendable, leaving, however, much room for the improvement which we may fairly hope the experience of this year's Show will bring. Some of the exhibitors entitled to exhibit in the Artisans' and Labourers' classes did not do so, but showed only with the Amateur exhibitors, thus losing the double chance they had of exhibiting in both, to which privilege their attention was specially called in the Rules on the back page of the Prize List. But this may have been due to their want of sufficient material to show in both sections. Among the Crotons exhibited in the Artisans' and Labourers' classes there were some groups of very good stuff, nice dwarf well-grown plants, showing on the part of the owners a good perception of the points required in a prize plant, taste in variety, appreciation of rarity, and evidence of good cultural skill. Needless to

say these plants took the prizes. The arrangements were somewhat complicated in having two sets of exhibits, one from Artisans and Labourers only, and the other from Amateurs, in which the Artisans and Labourers were also allowed to compete, of which liberty, as just said, but few availed themselves. It has been mentioned that some of the Artisan and Labourer exhibitors failed to take advantage of their double opportunity, and in practice it seemed, while giving extra trouble in arranging and judging, no benefit was evident from the distinction; for it appeared that few possessed the material to compete in both classes, while the Artisans and Labourers manifested that they could hold their own against the Amateurs, easily, in the latter's own classes. Therefore, in future Shows, I think this dual arrangement might, with advantage to exhibitors and judges alike, be dropped. Besides, except in the Plants, Flower and Poultry Classes, Amateur competitors are necessarily very few. The only loss arising would be a few prizes the less in cases where exhibits are now duplicated for the two classes of exhibitors. However, speaking of the plants and flowers, thanks to the admirable care and forethought of the Secretary, who had arranged the two divisions separately, though unavoidably in and out together in some groups, the judging was easy, enabling it to be expeditiously performed. A novel arrangement this year was adopted in judging the ladies' dinner-table floral decorations by a plebiscite of all the visitors entering the grounds during the first hour in the evening after the electric light was turned on in the sheds.

In the shed devoted to Fruit, Vegetables, Economic Products, Miscellaneous, Poultry and Bees, the great

variety and plethora of material caused a good deal of embarrassment in getting it all into order. The fact is the shed was only about half large enough to hold all the stuff, and allow at the same time elbow room for working. This shed had really only sufficient accommodation for the Fruit and Vegetables, and another shed as large was required for the Economic and Miscellaneous Products. This further accommodation is absolutely necessary if the goods are to be shown to advantage, and would save much labour and the confusion and perplexity that now exists as the exhibits come pouring in on the heels of each other from morning till night and over a good part of the following day, taking up on the latter day the time required for making and supervising the final arrangements, before the judging begins and visitors are admitted. It would also be a very great convenience to the Judges. The inclusion of such a miscellaneous and heterogeneous quantity of stuff, huddled together on the same benches, often one thing over another, conveys only an idea of inextricable confusion, though one may know full well at the same time that this is only an impression, there being order, as was the case at the past Show, thanks to the members of the Committee in charge, in the apparently helpless and hopeless confusion. With sufficient room the Economic section would lend itself readily to the precise and orderly arrangement and display of such material that is so characteristic of well-kept Museums in which such material is made a feature of. Had the Fruit and Vegetables been given necessary space to show each exhibit clearly on its own merits they would have filled the entire shed, with no room wasted. This, however, is only a suggestion for another year and another Committee to

consider, as its realisation is based on pounds, shillings and pence. I pass but few comments on the merits of the exhibits in this tent, as I was not officially concerned in it, and full detailed reports on the individual exhibits will be furnished to the Committee by the Judges of the respective Classes. There is one remark, however, that I may venture on without trenching on this duty of the Judges, and that is, how much the people have to learn of the great extent a sample gains in not only popular but commercial estimation and appreciation by attention to its selection, get-up and finish in preparing it for show, or market. There were samples in the Economic Classes of excellent quality, which if put on the market in the state they were shown would have realised only about half their intrinsic value owing to this neglect of attention to the details of general and uniform preparation and finish. In fact this neglect was so general that there were few samples exhibited on which a demonstration of what they might and ought to have been like could not have been given there and then. There were a few, however, well sampled and prepared, that would compare favourably with the best exhibited at any of the Shows held during recent years. Of presenting the more rapidly perishable kitchen-garden vegetables, such as salad, seasoning (pot herbs) and culinary material generally, displayed in suitable vessels harmonizing one with another, it might be in contrast, in water, none of the exhibitors seemed to have had the slightest idea. This, as on all previous occasions, was one of the weak points in the vegetable exhibits.

Now, after the very considerable labour and sacrifice of time and personal interests of the Secretary and

two or three of his coadjutors on the Committee in going about through the rural districts speaking and lecturing to the people on the subject, the question may be reasonably asked ; "Was there any marked improvement in the Exhibition this year over previous years ?" This I fear must be answered in the negative, though there was a vast increase in the number of entries and of stuff sent to the Show. All that can be said, as mentioned before, is that there were some good exhibits, but not a larger number proportionately—less I think—than at previous Shows. The evidence of steady advance from year to year, it may be said, should be the crucial test of the utility of these annual Exhibitions, but clearly the Georgetown public hold that it is not the only one that should be regarded ; for, year by year, though the quality of the shows may not have improved as much as was hoped for at first, they have grown by leaps in attraction, popularity and general esteem, the very great attendance this year attesting this beyond question.

The accommodation for the Poultry &c., though not all that a home fancier might desire and insist on, was greatly improved this year, really, indeed, revolutionised. At a very considerable expense on the part of the Committee, through the good offices of one of the members, galvanised wire pens were provided for each exhibit, and a wide bench to stand them on. Unfortunately, just at the last, when everything had been settled, a lot of entries were made, when the accommodation had already been exhausted. This caused much crowding and inconvenience, and as a consequence, some of the coops had to stand on the ground. Shading from the early morning sun was at first forgotten, but this Mr. Quelch



promptly provided, himself, much to the relief and comfort of the birds, as soon as he noticed it. I mention this incident only as evidencing the forethought and alertness of mind required of any one undertaking the responsibility of running a successful Exhibition. Without saying anything on the general merits of the Birds, I am at liberty to mention that the Show drew two delightful surprises to itself in the form of a pair each of wild geese and ducks. The former were exhibited by Mr. M. L. Da Costa. The species is known as the "Oronoque Goose," though those at the Show were labelled and judged as "Vicissi ducks," and as such took the first prize. They are very beautiful, rare, and highly interesting creatures, and very difficult to procure by residents in this colony. The other wild species is known as the "Bahama Duck" and was shown by Dr. Reid. It resembles in size and features the common lowlands Vicissi of this colony, but with the under half of the face white. Unfortunately one of this pair died at the Show. These two exhibits of rare wild birds added greatly to the interest of the "Poultry" section. There were, I should mention, two or three pens of the common and often semi-domesticated lowlands Vicissi duck, with, of course, other pens of both of the really domesticated ducks, the English and the Muscovy.

To close this very limited survey, which has touched only on points here and there, a word of regret must be expressed. After the great expense incurred by the Committee in advertising the Show, by posters, pamphlets, prize lists, &c., from end to end of the land, large districts of the colony took no notice, and contributed nothing. Some few cultivators in the villages took an

interest in contributing, but they were not numerous, the bulk of the exhibits from the rural districts coming from the peasantry, (who bestirred themselves heartily in the matter,) resident on the Canals No. 1 and 2. This seems to show a great deal of apathy among the general population; and that yet greater efforts require to be made to move their inertness. One does not forget of course that the more distant peasant cultivators reside from Georgetown the more difficult it is to get their produce to the Exhibition without local agencies, which, in one case at least, on the East Coast, Demerara, Mr. Queleh succeeded in securing through the ready co-operation of Mr. H. J. Gladwin—a gentleman resident among the villagers. It is still more regrettable that the owners and cultivators of more or less large estates under economic products other than sugar, almost as a body abstained from contributing. Two or three spirited gentlemen took an interest, and contributed, but the majority took no heed, missing the opportunity thereby of picking up what might perhaps be valuable ideas in seeing the results of each other's work and the measure of success achieved by each, in different ways possibly, in the subjects of common cultivation.

G. S. JENMAN.

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REPORT ON CLASS C.

Georgetown, Sept. 13th, 1897.

J. J. Quelch, Esq.,

Secretary, Horticultural Show.

Dear Sir,—In compliance with your request for a report on the Class of the recent Show in which we

acted as Judges (C. Fruit), we have the honour to tender the following :—

*Bananas.*—In the section for 3 bunches, different kinds, there were only four exhibits, and these not so good as we have seen, but that for one bunch was better, with 16 exhibits, those to which the prizes were awarded being very fine.

*Pine Apples.*—There were 11 exhibits, and the prize winners were very good.

*Mangoes.*—The collections of three kinds were very poor and none worthy of the first prize; one was disqualified from being wrongly entered. The baskets of one kind were better, but as mangoes are not now in season, we cannot expect anything very grand in the way of a competition.

*Mammee-Apples.*—There was a good show of 13 exhibits.

*Sapodillas.*—Some very fine samples were shewn and it was difficult to award the prizes.

*Star Apples.*—Only one exhibit of the purple variety was shewn, and this not so good as we have seen.

*Sour-Sops.*—Two exhibits, fair quality.

*Sugar-Apples.*—Three exhibits, good. No Custard-Apples.

*Granadillas.*—Seven exhibits, good.

*Simitoes.*—Six exhibits, rather poor.

*Bell-Apples.*—Two exhibits, fair.

*Guaquas.*—In the section for two varieties there were 9 exhibits and in that for one, 21 baskets. The samples were generally good.

*Avocado Pears.*—Six exhibits, good.

*Melons.*—As usual these were not numerous, (three

each of the two varieties) but they were good, and the 1st prize Musk Melon a fine fruit. There were no grapes, and we notice that at former Shows only one or two bunches have been shewn, which goes to prove that they are out of season at this time.

*Oranges.*—These exhibits, together with others of the orange family, were the most difficult in the whole class. There were 46 samples of sweet oranges, 22 Seville, and 5 Tangerine, nearly all of which were good of their kind. In judging these as well as shaddocks, limes, &c., we took into account thinness of skin, absence of pith, amount of juice, and flavour. Some of the oranges were very good indeed, the prize-winners standing the tests well in every respect. We should recommend that, in view of the fact that at some future period a fruit trade will probably be done with the United States, some of the best marketable varieties be introduced.

*Forbidden Fruit and Shaddocks.*—Some of these were very dry and pithy, one sample shewing at least two-thirds skin and cellular tissue. It appears as if size alone were taken into account in some cases, which is certainly undesirable.

*Citrons.*—There were only four exhibits, and as these are grown for their rind rather than pulp the size was considered of more importance than in the other members of the orange family. The prize winners were good.

*Lemons and Limes.*—Like the oranges, these were difficult to judge; there were 14 exhibits of the former and 35 of the latter. The prize winners were excellent, thin-skinned and very juicy. We should advise exhibitors in future to take these characters into consideration, for a big lime with a thick wrinkled skin, that on

squeezing hardly allows a drop of juice to ooze out, is absolutely useless.

*Cocoanuts.*—A very fine collection difficult to judge. Some very large nuts with thick fleshy kernels were considered the best.

*Fruit, other kinds.*—Exhibits of figs, golden-apples, so-called psidium cherries (*Flacourtia*) Mandarin oranges, Otaheite gooseberries, and ground nuts were awarded prizes. The last were thought worthy of commendation as an experiment, which we hope will lead to large cultivation on some of our sandy soils, where alone the nut would be likely to flourish.

In the section for artisans and labourers the exhibits of fruit were on the whole very good. The baskets of mixed fruit, however, were hardly as good as might be expected, and would have been better for a little tasteful arrangement.

A. R. GILZEAN,  
J. RODWAY.

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#### REPORT ON CLASS D, VEGETABLES.

The various vegetables cultivated in the Colony were fairly represented, but the quality was far below the exhibits of former Horticultural Shows.

The cause forcibly impressed on the Judges was defective tillage, want of careful supervision while the plants were in progress of growth, and a limited supply of manure.

In the working of future Shows it will be a useful innovation for exhibitors to attach the local name to each variety, such as butter stick cassava, barooma plantain, to which experts would attach the Botanic and correct

common names. If this were done it would not only centre the interest of the visitors, but initiate a fixed nomenclature to be applied to all vegetables cultivated in British Guiana.

The utility of the Agricultural or Horticultural Exhibitions is to give him an opportunity of observing the qualities of the various varieties of each species.

By taking the prize variety as the standard, and critically studying the other varieties of the same species, the agriculturist may then determine how he may adopt measures to enable him to cultivate and reap in a profitable way a whole crop equal to, or better than, the prize exhibit.

By this means an acre so cultivated will give a better return in money if the price is low than an inferior crop at high price.

One variety of bitter cassava is said to give more starch, pound for pound of raw roots, when manufactured, than other varieties. This being the case, the planter has to discover by experiment if this particular variety, when planted on the soil he occupies, will produce more starch from a whole acre, or bed, than the other varieties; these others might turn out a much greater weight of roots per acre than this particular variety mentioned above and thereby overtop the yield of starch per acre or bed.

We may add that the variety must be chosen to suit the kind of soil, whether the vegetable be cultivated for the root, fruit, or leaves.

There is a very exhaustive paper on the plantain in the *Kew Bulletin* of August 1894, which is worthy of being read.

Plantains were of medium quality and size, and the prizes were awarded to the best varieties.

Roots were generally inferior, there being more difficulty in deciding what was worthy of an award than what was not.

Pumpkins were without exception inferior to the two previous Exhibitions, both in quality and number.

Corn; most of the exhibits were badly grown, and some not ripe; the basket awarded the first prize was well grown and ripe.

Herbs should be represented by a bunch of each herb, and not a bunch of one sprig of each herb.

Ochroes were fairly well represented; awards were given to those in best condition for culinary purposes.

Papaws, for preserving, were really good, two exhibits being fine and superb.

Peppers were well represented.

The exhibits of Beans were the poorest possible. Cabbage and Lettuce were equally so. We must here emphasize the want of care and manure evidenced by each sample. We may here observe that it is necessary for the purpose of obtaining good heads of Cabbage and Lettuce to place an awning of Palm leaves, 3 feet above the plants, from 9 a.m. till 4 p.m., the plants will then get the benefit of the dew during the night and be protected from the scorching sun by day.

With the exception of the Tomatoes that obtained first prize, the samples evidently were deteriorated by having grown from bad seed. It is well known that seeds reaped and sown in the same soil year after year become deteriorated in size and quality and deformed in shape. Cucumbers and Indian Corn suffer from the

same cause. To plant Corn in pegass soil the seed should have been grown on sandy loam or clay soil.

If occupiers of land who cultivate vegetables will attend to the above by obtaining suitable seeds and plants, and suitable to the soil intended to be planted, and devote careful ingenuity to the maturing of the plants, they will be able to produce exhibits worthy to compete successfully with those forwarded by the most experienced planter or gardener.

We desire to thank the gentlemen who carried out the arrangements, for the efficient manner in which the exhibits were placed for inspection and the considerate attention bestowed by Mr. Quelch.

W. T. BINNIE,

JOHN JUNOR,

Judges of Class D.

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#### THE BOTANIC GARDENS EXHIBIT.

Having been deputed by the members of the Committee of Correspondence to report on the Botanic Gardens Exhibit at the recent Horticultural Show, I beg to submit the following :—

The exhibit was not for competition but intended solely as a display of how plants are staged at Shows at home, and the uniformity required there in the character of the pots or other receptacles used in showing plants at Exhibitions.

Half the bench on one side of the plant house was devoted by the Committee to the display. This comprised a superficial area of 180 square feet, which space, however, though an extension of the area allowed at the previous Show, proved again too limited for the satisfac-



tory display of the exhibit. The plants were arranged in a dozen or more groups, partly based on their natural affinities, and partly on their economic uses and qualities. Several groups were composed of subjects in which ornamental foliage and flowers were combined; other groups again simply for their foliage or flowers alone. The former were chiefly Aroids; some with strikingly handsome foliage, and nearly all with very curious, attractively coloured and often grotesque inflorescences, which differing much in particular were all much of the same form and general character. Other groups of ornamental foliage plants, well selected for variety, were begonias, (some in flower), marantas and calatheas, crotons, dracænas, ferns and selaginellas, palms, Aralias, &c. A defect in the exhibit as a whole was the lack of the varied light colour afforded by bright flowering plants—such colour as dominates and gives the chief character to Flower Shows as well as gardens at home; but Shows in tropical lands necessarily partake of the character of the gardens, meadows and forests of such lands, which are rich in leaf colour, but, with few marked exceptions, poor in flower display at any time of the year. There were several sets of economic plants, grouped according to their kinds, but not very effective, as the plants had of necessity, through the exigencies of space, to be selected for smallness of size rather than for good cultural appearance. These plants, however, are familiar to visitors resident in the tropics and if ever so well staged would not create the interest they do in hot houses and at Shows at home, and perhaps the extra space, which the more showy plants require for their better display, could be secured by dispensing with these, without any notice-

able loss to the general effectiveness of the exhibit. The collection attracted much attention from visitors interested in pot plant culture. Each group had a conspicuously placed printed ticket describing its character, and each plant its botanical name attached.

T. SYDNEY HARGREAVES,  
Vice-Chairman, Committee of Correspondence.

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REPORT OF THE JUDGES IN CLASSES E AND F.

As in the preceding year, a great increase in the Class E had taken place, but this increase, we regret to say, was almost entirely confined to this point, little or no improvement being noticeable in the qualities of the articles exhibited.

CLASS E.—ECONOMIC PRODUCTS.

*Section 1.—Open to Amateur Exhibitors.*

125. *Coffee, cleaned.*—There were thirteen entries for this article. The exhibit was not up to the standard of the preceding year either as regards colour or cleaning. A good sample of peaberry coffee was sent which received the first prize. We would again impress upon cultivators that it is practically useless to produce other than high grade coffee for export purposes, and that for this, coffee must be of good colour, perfectly clean and even in size of the bean, and that the presence of broken beans must be avoided.

126. *Liberian Coffee.*—Only three exhibitors competed. A sample from the Onderneeming Reformatory was far in advance of the others in every way, it was of fair colour, excellently cleaned and even in character.

127. *Cacao Beans, cured.*—Six competitors only. The exhibit was if anything inferior to that of 1896. The

first prize was awarded to a well cleaned bean of excellent flavour and of good colour.

128. *Kola*.—Practically no competition, the only sample sent was not thought worthy of a prize as it was too dark in colour and appeared to have been scorched during drying.

129. *Rice*.—Only five samples were exhibited, no one of them of marked merit. The exhibit this year struck us as being far inferior to that of 1896.

130. *Cornmeal*.—Twenty one exhibitors competed, and several of the exhibits were of great merit, that to which the first prize was awarded, being excellent in colour, flavour and fineness.

131. *Plantain Meal*.—Forty four samples competed, several of the samples being of excellent quality and possessing an inviting pale cream colour. Few of the samples showed to any marked degree the objectionable grey colour to which we alluded in our remarks last year.

132. *Cassava Meal Farine*.—Fifty three competitors entered for this, and a very excellent show of exhibits was the result. The first prize was awarded to a sample of excellent colour and flavour, and uniform in grain. Many other samples closely approached it in these particulars, and we, in consequence, awarded several extra prizes.

133. *Arrowroot*.—Ten competitors; several excellent samples were shown.

134. *Tapioca*.—Three samples were exhibited, two which received the first and second prizes being of very good quality.

135. *Tous les Mois*.—Two exhibits only, neither of any marked merit.

136. *Other Starches*.—Forty two competitors, many of whom sent exhibits of high quality. Several extra prizes were awarded in this section.

137. *Vanilla*.—Two samples only, neither of very good quality.

138. *Honey*.—Seven samples were exhibited, one only possessed any merit.

139. *Tobacco, cured*.—One sample only exhibited which was of fair quality.

140. *Cayenne Pepper*.—Eight competitors; the samples showed much variation in colour and aroma. Those prized struck us as being of high quality.

141. *Guinea Peppers, dried*.—Eight samples were exhibited and several of them appeared to be of high merit.

142. *Black Pepper*.—Two samples only, the first prize being awarded to one of very fine quality.

143. *Essence of Pepper*.—Four exhibits. That to which the first prize was awarded was of pleasing colour and aroma.

144. *Pimento*.—Two samples only, of moderate quality.

145. *Dried Ginger*.—Three competitors exhibited, but the samples sent were not of high quality.

146. *Pickles*.—Six exhibits, generally of fair quality.

147. *Hot Sauce*.—Eight exhibits, none of which were of marked merit.

148. *Chutnee*.—No exhibits.

149. *Curry Powder*.—Six exhibits. That taking the first prize was of excellent colour with an exquisite flavour and marked aroma. The others were all of high merit.

150. *Guava Jelly*.—Seventeen competitors. The ex-

hibits as a whole showed more merit than in the preceding year, the samples prized being of very fair quality.

151. *Other Jellies*.—One sample only which was not prized.

152. *Jams*.—Two competitors, neither of whom sent samples deserving of a prize.

153. *Marmalade*.—Five samples. Those prized were of very good flavour and appearance.

153. *Marmalade (extra)*.—Six samples, one of which—Guava Marmalade—was of excellent flavour, colour and appearance.

154. *Stewed Guava*.—Ten competitors, several of whom sent samples of much merit.

155. *Cassareep*.—Seven samples entered. Those prized were of fair, but not excellent quality.

155. *Extra*.—An exhibit sent as Cassareep vinegar, which called for no remarks.

156. *Prepared Chocolate*.—Six samples, one prize only awarded. A most disappointing exhibit as compared with that of 1896.

157. *Bees Wax*.—No exhibit.

158. *Crushed Feed*.—No exhibit.

In connection with this section, a collection of jams, jellies, etc., were sent marked as not being for competition. The collection, while in marked contrast as regards the taste shown in putting up the articles to the jams, jellies, etc., exhibited in the section, was, in our opinion, very judiciously labelled as not for competition, for in almost every instance the flavour and quality of the articles exhibited was inferior to that of those prized by the judges.

*Section 2.—Open to Artisans and Labourers only.*

159. *Preserves.*—Six exhibits of, on the whole, very fair quality.

160. *Jellies.*—Thirteen competitors sent samples, those to which prizes were awarded being of good quality.

161. *Pickles and Hot Sauce.*—Nine exhibits. We are of opinion that there was a marked improvement over those shown in 1896.

With reference to the exhibits in Nos. 159 to 161 of this section and also in many cases to those in Nos. 146, 147, 150 to 154 of the preceding section, we would call the attention of exhibitors to the fact that the not unfrequent lack of uniformity in the bottles used and the idleness conspicuously shown by the non-removal of old and defaced labels from them, are eyesores not only to the Judges but to visitors. These points could easily be remedied by a little care.

162. *Coffee, cleaned.*—Fifteen competitors sent samples. All shewed marks of defective cleaning, and, as a rule, the colour was anything but good.

163. *Coffee, Liberian.*—One sample only of moderate quality.

164. *Cacao, cured.*—Three exhibitors only, none of any merit.

165. *Rice.*—Seven competitors, shewing excellent samples.

166. *Corn.*—Eighteen persons sent samples of high quality.

167. *Starches.*—Thirty-nine competitors contributed an excellent show of Starches, and, in consequence, several extra prizes were awarded to samples which in quality closely approached the samples receiving the prizes offered.

168. *Leaf Tobacco, cured*.—One exhibit, only of very fair quality.

169. *Raw Cotton*.—Six samples exhibited, all of good quality. The 1st and 2nd prizes were awarded to two samples of excellent quality, long in the staple, good colour and very finely cleaned.

Thirty-four exhibitors sent in samples as extras to the general list. Among these were Crab Oil, Cocoanut Oil, Preserved Tamarinds, Preserved Limes, Lime Juice, Papain, Castor Oil, Rice Paddy, Gums, etc. Several received extra prizes for their exhibits. Such exhibits are useful not only as shewing certain of the resources of the Colony, but also as supplying suggestions for prizes to be offered at future Exhibitions.

CLASS F.—MISCELLANEOUS.

170. *Flower Pots*—No entries.

171. *Orchid Baskets*.—One exhibit not prized.

172. *Plant Baskets*.—One exhibit to which a second prize was awarded.

173. *Plant Tubs or Boxes*.—No exhibits.

174. *Pieces of Bamboo or Rustic Furniture*.—No exhibits, no prize awarded.

175. *Hive for Bees*.—One exhibit, to which was awarded a first prize.

We desire to call the attention of the Committee of Correspondence to the very unsatisfactory nature of the competitions in this class. We have noticed that year by year interest in it has steadily diminished and we venture to suggest that neither the interests of the Horticultural Show nor the general public would suffer by the removal of the section from the prize list.

We must congratulate the Royal Agricultural and

Commercial Society on the increased success of the section of the Show dealing with economic products. Our remarks of last year in the concluding paragraph of our report apply equally to the exhibits shewn this year, and we must emphasize the fact that if success is to be hoped for in meeting the critical demands of foreign markets, far more care and knowledge must be exercised in the preparation of the articles. We, at the same time, fully recognise that this has been emphatically this year a small producers' Show, the great majority of the larger growers refraining from exhibiting. But our small producers are factors of great economic importance in the general welfare of the Colony, and they are the people to whom it is desirable that the annual Show should appeal. For instance, in the case of Coffee, different degrees of care in the picking, curing and cleaning will make differences of from £1 to £2 per cwt. in the selling value of the product in the London market, and similarly with Cacao. Possibly in certain cases this year exhibitors in this section have found reasons for questioning the correctness of our adjudications, but in the cases of Cacao, Coffee and similar products we felt it our duty, as a rule, to lay more stress upon the preparation of the articles for market than upon properties due to cultural and soil conditions.

B. HOWELL JONES,

Chairman of the Agricultural Committee, Royal  
Agricultural & Commercial Society.

J. B. HARRISON,

Government Analyst.

Georgetown,

October, 1897.



## CLASS G.

Georgetown, September 16th, 1897.

J. J. Quelch, Esqre.,

Dear Sir,—I understand that a few remarks are expected from me as one of the Judges at the Horticultural and Poultry Show, that took place on the 9th inst. Poultry having been the Department that I had the judging of, I may say that in point of number the exhibits were much the same as last year, but as to the quality of the same there was a very marked improvement.

The wire netting coops for the birds are an advance in the right direction, a great improvement as to the comfort of the birds as well as giving a better view of them to the visitors. I think, however, that a thin board should be placed at the bottom of each cage or pen ; so allowing the feathered inmates to have a flat surface to tread on, instead of the wires of the netting, this especially in the case of web-footed birds.

Again, it would be better to have the tins for water and grain fastened some 3in. up in the side of the pens, instead of on the bottom, where the birds upset the water and grain, in their attempts to scratch, "as is their nature to."

As to the prizes, I may perhaps be allowed to suggest that there seems little use in having more than three prizes, except for poultry. The money for 4th and 5th prizes might be added to the first one. In fact I think if the value of the three first prizes were increased, it might help to draw more exhibitors in poultry.

I am, &amp;c.,

GEO. BAGOT STEELE.

On the motion of Mr. Thomas Daly, seconded by Archdeacon Gwyther, a vote of thanks was accorded to the Committee for the trouble they had taken in getting up the Horticultural Show, and for their valuable report.

The Secretary reported that the Directors had received an application from Mr. Ellis Barton for the sum of £50 to enable him to perfect an invention for the improved manufacture of sugar; to which request they regretted they were unable to accede.

The Secretary also reported that the Directors had authorised the Librarian to enforce the rules in regard to the time for keeping books, and to impose the fines for detention beyond the number of days stated in them.

Mr. T. S. Hargreaves brought forward his motion for printing the proceedings of the Society, in view of the discontinuance of *Timehri*.

He had been asked the other day, he said, by a friend in London, if he was responsible for the discontinuance of the Journal. He certainly could not remember that such was the case, as all he had to do with the matter was to propose in the Committee of Correspondence, which Committee he then believed had the control of the Journal, that a Sub-Committee should be appointed to assist the editor. However, this had fallen through, and the next thing he heard was that the Directors had always had the control of the Journal, and that they had decided to discontinue it. He thought it would be a pity to give up printing the proceedings, for he had found them very useful, and he also thought they might continue to use the name. He would like, with the consent of the meeting, to alter his motion to the following:—

“That the Directors be requested to print the Pro-

ceedings of the Society half-yearly or annually, under the name of *Timehri*.

Mr. Hargreaves was continuing when Mr. Luke M Hill called attention to the fact that, owing to the departure of a member, there was no longer a quorum, the Chairman therefore declared the meeting to be informal and allowed Mr. Hargreaves to lay over his amended motion until the next meeting.

The Secretary hoped that there would be a larger attendance at the next meeting, which was that for the election of Office-bearers for 1898.

Donations to Muselum :—Frog-fish, collection of insects, tobacco, india-rubber, deer's antlers, presented by Mr. G. S. Jenman ; British Guiana birds' eggs by Miss M. Harding ; piece of pottery by Mr. Menzies ; palm beetle by Mr. J. Graham ; long-legs and pica plover, chirps and knots by Mr. H. L. Humphrys ; knots, white winged plover, sanderly by Dr. Egan ; Colubrine snakes and ocelot by Mr. J. A. Barclay ; blue slag by Mr. H. Seedorff ; fasciated tannia by Mr R. A. Barclay ; snakes and marabunta nest by Mr. J. L. Theobald ; hawk-moth by Mr. A. A. L. Stoby ; fig-moth by Mr. Owen Forbes ; fused glass by Mr. W. P. Kaufmann ; bees' nests by Hon. B. Howell Jones ; spider by Mr. H. Smith ; Bahama duck by Dr. Reid ; bunya nest by Mr. C. Simpson ; Turkish coin by Mr. G. Malouf ; rare little owl by Mr. A. B. Barnard ; fresh-water hemipteron by Miss Parrett ; sun-beetles by Mr. J. Grant ; crustacean by Mr. W. G. Fulton ; grasshopper by Mr. H. Winter ; racoon by Mr. L. M. Hill ; bufo toad and insects by Mr. F. A. Conyers ; gannet by Mr. Straker ; manjack by Mr. S. T. Hassell ; fire-fly—" three lights"—by Mr. A. J. Pemberton ; hedge-hog by

Mr. W. T. Johnson ; mixed coins by Mr. T. J. Semple ; a beetle by Mr. C. Alstine ; *Dynastes hercules* by Mr. J. G. Houston ; mixed insects by Mr. H. G. S. Hassell ; jumping beans of Mexico by Mr. F. V. McConnell ; small moths by Mr. John Christopher ; smooth melanias by Mr. G. F. Franks ; Indian basin-pottery by Mr. E. F. im Thurn ; photographs of Niagara Falls (2) by G. A. Zabriskie ; collection of Barima rocks by Professor Harrison and Mr. H. I. Perkins.

The meeting then terminated.

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*Meeting held December 16th.*—Professor J. B. Harrison, M.A., &c., President in the Chair.

Members present 19.

Election.—*Associate* : Mr. A. W. Edghill.

The Honorary Secretary reported on behalf of the Directors, in reference to the resolution in regard to a Tobacco Premium passed at the General Meeting of July 8th, that at their last meeting it was resolved :—

“ That at the next General Meeting, the Members be informed that the Directors had been unable to take action in the matter for want of sufficient information, and that they request the mover, Mr. T. S. Hargreaves, and the seconder, Mr. Æneas D. Mackay, to supply such information.”

Mr. Hargreaves said that he was hardly prepared to formulate the necessary conditions, but he would suggest that the matter be referred to the Commercial Committee, which suggestion was adopted.

Mr. Hargreaves brought forward his motion :—

“ That the Directors be requested to print the proceed-

ings of the Society half-yearly or annually, under the name of *Timehri*."

Having read an extract from the *European Mail* suggesting that efforts be made to gain the support of West Indians in London, before giving up the Journal, Mr. Hargreaves remarked that this suggested that the Society was too poor to continue its publication. This question of poverty was, he thought, a bogey raised by the Directors. They had found it possible to stand the loss for fifteen years and it had never before been stated that the Society could not afford it. If the expense was too great it might be published less often, or perhaps at a lower cost. That, however, was a matter for the consideration of the Directors, but he must say that if they stopped the publication, they discontinued the means they at present possessed of passing on the Society's work to future generations. Sometimes they had papers read at the meetings which were the result of years of work and experience, and although these were published in the newspapers, this mode of publication was necessarily very ephemeral. If *Timehri* were discontinued these papers would be almost useless. If the Society was to exist as a semi-scientific Society it should do as other learned Societies throughout the world did, *i.e.*, publish their proceedings. The editor would bear him out in saying that many valuable exchanges were received. If the Journal were stopped it would undoubtedly lower the status of the Society and give reason for the taunt of Dr. Carrington that the Society was nothing more than a Circulating Library.

Mr. A. R. Gilzean, in seconding the motion, said that the President was aware that there was little life in the Society, and he thought that the best thing they had done

was the publishing of the Journal. He was quite sure the money was well spent, and if the Society was to continue and do some good for future generations it was of much consequence that the publication should not be discontinued.

In reply to a question from the Revd. W. B. Ritchie, the President said that in the last nine years they had lost \$2,798.51, being an average of \$295.56 per annum.

Mr. Quelch, as one of the former editors of the Journal, said that when he took it over in 1886, at the request of the Directors, it was guaranteed that the loss to the Society should not be more than £100 per year, and he could say that it had never reached that amount since. Under Mr. Thurn, himself, and the present editor, the Journal had been more appreciated outside than in the Colony. He could not say what was the reason for this, but he could affirm that it had given publicity to matters affecting the Colony that would otherwise have only been printed in a newspaper or not at all. *Timhri* had raised the status of the Society and if less money had been received from its sales lately it still went to outside Societies by which he was sure it was highly valued. From these Societies a good number of publications were received in exchange, which might be seen upon the tables. It would be a pity to discontinue the Journal, but possibly the Directors might see some way of reducing the cost. They could not expect it to pay directly, but he was convinced that it did so indirectly in *kudos* to the Society and the Colony.

The President said the motion was to print the Proceedings, not to continue *Timhri* in its present form.

Mr. Gilzean said he understood that it was to continue the Journal.

Mr. Hargreaves explained that he purposely worded his motion in that way, leaving the Directors to say whether other than the Society's papers should be printed; he would like however to see the Journal continued.

Mr. A. E. Messer moved as an amendment :—

"That the publication of *Timehri* be continued in its present form at such cost to the Society as the Directors may arrange."

Mr. Jacob Conrad seconded.

Mr. L. M. Hill said that, although a Director, and although it might appear to be bad form to support the amendment, he might mention that he had always been opposed to the discontinuance of the Journal. It was much appreciated at home, and extracts from it were often published in scientific periodicals.

In reply to a question from Rev. W. B. Ritchie, the Assistant Secretary said that tenders had been asked from three printing offices.

Mr. Hargreaves said he was quite prepared to accept Mr. Messer's amendment, which, on being put to the vote, was carried unanimously.

The Secretary read the following letter from Mr. R. W. S. Mitchell, Calcutta :—

Government Emigration Office,  
21, Garden Reach,

Calcutta, 21 September, 1897.

Sir,—I have the honour to acknowledge the receipt of your letter of the 16th August last, and am much gratified by the vote of thanks recorded in my favour.

I may mention that, by last mail, I sent to the Colony

some grain known up country as "Ka Keon," much used by the poorer classes, which might prove of use. I have also submitted estimates furnished by a local Firm for the supply of Rice Mills capable of turning out from 10\* to 25 tons of clean rice daily.

The price being in Rupees, I fancy it would be cheaper than importations from Europe or America.

As regards the cane plants from Burdwan sent some time ago, I planted one or two slips here, that appeared unlikely to stand the voyage, and they have developed into splendid stools of fine juicy looking canes. Should therefore the plants sent fail entirely, I shall be able to supply plants grown under my own eye here.

I understand the Natal Government has applied for 10,000 cane plants of the Puna variety.

I have, &c.,

ROBERT W. S. MITCHELL, C.M.G.,

Govt. Emigration Agent for British Guiana.

The Secretary,

Royal Agricultural

and Commercial Society.

This was referred to the Agricultural Committee:

The following Government communication on the same matter was also read and referred to the same Committee:—

Government Secretary's Office,

Georgetown, Demerara,

10th November, 1897.

Sir,—I have the honour to forward herewith for the information of the Royal Agricultural and Commercial Society, a copy of a letter from Mr. R. W. S. Mitchell,

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\* The 10 Ton Mill would cost about £1,200.



C.M.G., Emigration Agent for British Guiana, in India, enclosing copy of a communication from the Manager, Chetta Rice Mills, submitting estimates of three sizes of Rice Mills and quoting prices in rupees.

I have, &c.,

CAVENDISH BOYLE.

The Honorary Secretary,

Royal Agricultural and Commercial Society.

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From Emigration Agent, Calcutta, to Govt. Secretary.

16th September, 1897.

Sir,—I have the honour to transmit herewith a copy of a letter of 16th inst., from the Manager of the Chetta Rice Mills, submitting estimates of three sizes of rice mills, quoting prices in rupees.

I presume it would be cheaper purchasing such machines in India, owing to the difference of exchange, besides their being in practical use here, and therefore well adapted to the work required of them.

The 10 ton mill, with the various appliances, at Rs. 21,455. 0. 0, at 1s. 2½d per rupee, would cost in sterling about £1,296. 0. 0.

I have, &c.,

ROBERT W. S. MITCHELL.

Government Emigration Agent for British Guiana.

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From Manager Chetta Rice Mills to Emigration Agent,  
Calcutta.

16th September, 1897.

Dear Sir,—With reference to your conversation with me on the 15th of July last, about the construction of three small Rice Mills, in British Guiana, I beg to enclose

herewith the estimates for them, in different shapes, for your approval.

The particular novelty of my new patent polishers is that they give only 1 per cent. broken rice and no more, whereas the other polishers generally give 5 to 6 per cent. broken rice.

Yours faithfully,  
(Sgd.) F. SCHWARZLAS,  
Engineer and Manager.

**PRICES OF RICE MILL PLANTS.—DELIVERED AT CHETTA.**

| Capacity.                | Price ea. |       | 10 tons.   |        | 20 tons.   |         | 25 tons.   |     |
|--------------------------|-----------|-------|------------|--------|------------|---------|------------|-----|
|                          | Ra.       | No.   | Ra.        | No.    | Ra.        | No.     | Ra.        | No. |
| Polisher at ...          | 4,500     | 2     | 3,000      | 2      | 3,000      | 2       | 3,000      | 2   |
| Husking Mill at...       | 4,600     | 3     | 4,800      | 5      | 8,000      | 6       | 9,600      |     |
| Fans, at ..              | 900       | 2     | 1,800      | 2      | 1,800      | 2       | 1,800      |     |
| Main Shafting, at        | 2,980     | Set   | 2,980      | Set    | 2,980      | Set     | 2,980      |     |
| Counter Shfts., at       | 575       | 1 Set | 575        | 2 Sets | 1,150      | 2½ Sets | 1,437      |     |
| Sieves, at               | 600       | 4     | 2,400      | 8      | 4,800      | 8       | 4,800      |     |
| Elevator Gear, at...     | 700       | 2     | 1,400      | 3      | 2,100      | 3       | 2,100      |     |
| Engines & Boilers 12 Hp. |           | 1     | 4,500      | 20 Hp. | 6,500      | 34 Hp.  | 13,200     |     |
|                          |           |       | Rs. 21,455 |        | Rs. 30,330 |         | Rs. 38,917 |     |

A second Government communication calling attention to the Omaha International Exposition was taken for notification.

The Secretary read the following letter and enclosure from Dr. Morris:—

Kew, 29 October, 1897.

Dear Harrison,—I am in receipt of your letter of the 28 September, respecting the samples of coffee sent from British Guiana. The latter were duly received and I was greatly interested in looking over them. There is no doubt coffee can be grown in British Guiana. That was evident from the samples. But it was equally evident that the preparation of the produce is in a very

crude and primitive state. In order to obtain a commercial opinion upon the various sorts of coffee, I selected two of the best of the Arabian and Liberian samples and forwarded them to Messrs. Lewis and Peat, the well-known Produce Brokers in Mincing Lane. I enclose their report. Considering the great fall in prices recently, this is a very promising statement. It is admitted that the coffee itself is good, but it has been so badly prepared that it has lost nearly one-half its value. You will notice that if the coffee had been properly prepared the market value would have been from 60/ to 80/ per cwt.

The suggestion in regard to shipping coffee to this country in parchment is one that should receive serious attention. You will find plenty of information on the subject in the *Kew Bulletin*. See June, 1893 p. 128. I enclose one on Liberian coffee herewith. When parchment coffee\* is cleaned in London, it costs only about 2/6 per cwt. This is much less than the cost of cleaning by hand and the product is of much greater value. Liberian coffee is not so readily cleaned; but it can be done. It would be of great service to those engaged in coffee growing to let this be widely known.

All that really need be done in the Colony is to pulp the coffee. This is a simple process and several good machines are available to be worked by hand or by power. Particulars of suitable machines as used in Jamaica could be obtained from Fawcett.

The suggestion made by Messrs. Lewis and Peat in regard to Cacao is an important one. Cacao was very

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\* I send a sample of parchment coffee in a separate packet by this Mail.

depressed not long ago, but it has apparently picked up again. There is always an ebb and flow in the price of Colonial produce, but there is one matter always to be borne in mind and that is, a really good commodity well prepared and skilfully presented will always stand a better chance than an inferior one.

I am glad to hear Rice is being taken up so vigorously.

With kind wishes, &c.,

D. MORRIS.

Professor Harrison, F.C.S., F.I.C.

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Messrs. Lewis & Peat to Royal Gardens, Kew,  
6, Mincing Lane, London, E.C.

October 26, 1897.

Dear Sir,—We duly received your favour of the 23rd instant, with samples of coffee from British Guiana, which we have carefully examined, and beg to report upon same as follows :—

ARABIAN.

No. 1 Canal, small, broken, and very mixed in colour, some green and some foxy, apparently grown from East India seed and badly prepared, value about 38/ to 40/ per cwt.

West Bank, ditto, peaberry, value about 55/ to 60/.

LIBERIAN.

West Bank, mixed in size and very poor in colour, value about 38/- per cwt.

Essequibo River, good, bold, clean, and well prepared, value about 45/- per cwt.

In reference to the Arabian samples, it is quite evident that they have not been prepared in the right way. The

Coffee is a good deal damaged and broken in cleaning, and of all colours. We would suggest sending home small parcels, well cured and dried in *parchment* that can be cleaned here, taking great care that berries which have fallen on the ground and thereby spoiled are not mixed with the good berries. We should probably get a much better result.

Coffee, such as samples now before us, owing to the very low prices now ruling for Santos and Rio descriptions from Brazil, cannot possibly pay, but might eventually do so if cured and cleaned properly, in other words, good and fine Coffees may keep up in value, and good ordinary sorts remain very low. *Our opinion is that if a well cured sample could be produced it would bring 20/- to 30/- per cwt. more, say 60/- to 80/-.* At present there is no chance of Liberian going up, there is too much Brazil.

Have your friends thought of cultivating Cocoa? We should recommend this if the ground is suitable. Present prices range from 65/- to 75/- per cwt. and the prospects are good, whereas except for fine Coffees the outlook is not bright.

We are, etc.,

(Signed) LEWIS & PEAT.

On the motion of Mr. Messer, a vote of thanks was accorded to Dr. Morris for the trouble he had taken in the matter, the Secretary being directed to convey the same.

The Secretary read a circular from the Imperial Institute stating that a Commercial Reading Room had been opened at the Institute, which was ordered to be laid on the table.

The President then gave the following valedictory address :—

Some months ago I was required to deliver an inaugural address as the newly-elected President of the R. A. & C. Society, and now I am about to say a few words on the occasion of the termination of my period of service as President of this Society.

During the year I regret to say that our number has somewhat diminished. I have not been able to ascertain in what class of members the decrease has occurred, but there is a loss of six members. This is less than one would have expected, having regard to the depression which marked the year. Amongst the losses we have that of Mr. Henry Kirke, an ordinary member. We have not wholly lost Mr. Kirke, however, as he has become an honorary member. The losses due to death are few. We have first of all Mr. H. H. Cunningham, who for several years was a member of the Correspondence Committee, and each year took a deep interest in the Horticultural Show. In fact, he was one of the first members to suggest that we should have a class in the Exhibition devoted to artizans and labourers exhibits, and that department always commanded his greatest interest. We have also lost Dr. J. R. Hill, Messrs. J. A. Hill, and T. W. Phillips.

But little interest appears to have been taken in the meetings of the Society during the year, and the absence of the more prominent members of the Agricultural and Commercial sections of the Society has been noticeable at the majority of the meetings, I cannot hide from myself that this apparent lack of interest on their part has probably been due to the unfortunate selection of a

President who belongs to neither of these bodies, and hence is not cognisant of their requirements. ("No, no,") At the same time it does not seem to be generally recognised in the colony that the details of the agricultural questions which crop up here from time to time are, as a rule, fully discussed at the monthly meetings of the Agricultural Committee of the Society, and that much useful, though quiet, work is there carried on.

The programme for the year, as indicated in the short address I delivered in January last, has not been carried out in its entirety. I have failed to obtain addresses or papers from members who are well qualified to prepare and deliver them.

The Royal West India Commission visited the colony soon after our January meeting, and two special meetings of the Society resulted therefrom. At the first Dr. Morris, who accompanied the Commissioners as scientific botanical expert, delivered an address dealing with the possible agricultural products of the colony other than sugar. The lecture was an able summary of facts, the majority of which were already well known, and, to my mind, the value of the meeting depended largely upon the expressions of practical experience on, in several instances, large scales, which fell from the later speakers. A valuable and possibly somewhat novel suggestion was made by one of the speakers—the cultivation of ground nuts, but strangely this has not been followed up by either local or foreign capitalists. On the whole the meeting appears to have had but little effect on the present or future industrial pursuits of the colony.

The later meeting was the one recently held in this hall in conjunction with the Chamber of Commerce and

the Planters' Association, at which resolutions dealing with the Royal Commissioners' Report were passed. Some complaints have since been made that the meeting confined itself to one subject of discussion—the desirability of the cessation of bounties on sugar, or of the imposition of countervailing duties. When the failure of the efforts to obtain these, to my mind, almost certain remedies for our present distress, has taken place, then will be the time for discussion of the very few suggestions offered by the Commissioners or by Dr. Morris on the cultivation of economic agricultural products to take the place of our present staple.

The latter has alluded to the great fertility of the interior of the Colony. I do not know on what grounds he based his supposition of this great fertility. I can find no grounds for believing that in a country having the geological structure the interior of this has—sandstones and some hundred of conglomerates, archean granites, gneiss and crystalline schists—great tracts of land of exceptional fertility will occur, although possibly tracts of limited area may occur in valley land and river bottoms or on the lines of dykes of certain classes of intrusive rocks. I may mention that as far as our analytical examinations of some hundreds of the soils of the interior and seaboard of the Colony extend, no indication of exceptional fertility in soils, other than those of our alluvial coastlands, have been obtained. All point to the wisdom of our Dutch predecessors in ceasing their attempts to raise economic agricultural products on many of the soils of the interior.

In my January address I alluded to the necessity of the Agricultural Committee dealing with certain obscure



plant diseases. Fortunately for us, during the year, but few opportunities have occurred for their study, and, owing to climatic conditions, and in part, doubtless, also to the efforts of the planters in combating these diseases, at present, on the whole the canefields of the Colony are fairly free from the diseases prevalent in certain years, although these still linger to some extent among us. And in combating the diseases, it is a matter of congratulation for us that the planters have not been compelled to abandon the cultivation of the Bourbon cane and to resort to that of the heterogenous mixtures of canes now raised in Barbados.

The Committee of Correspondence have continued their efforts during the year to stimulate the interest of the farmers and labourers of the Colony in the cultivation of minor agricultural products and that these efforts are bearing fruit to some extent was clearly shown by the excellent exhibits at the annual Horticultural Show. This, as you are all aware, was a marked success; it again showed that the Colony can produce samples of agricultural produce other than sugar equal to those raised elsewhere. The artisans and labourers were well to the fore and this fact alone should act as a reward for and as an incentive to the labours of those in charge of the exhibition. And in speaking of the exhibition I must not omit to mention the untiring efforts of Mr. Bellairs, the Chairman, and of Mr. Hargreaves, the Vice-Chairman of the Committee of Correspondence, the valuable services rendered by Mr. L. M. Hill, Mr. Mackay, Mr. Scard and the other members of the Committee, all of which united with the incessant labours of the indefatigable secretary, that best of showmen, Mr.

Quelch, in rendering the exhibition a marked success. The steps taken by the Committee in increasing the prize list and especially the giving of considerable numbers of prizes of comparatively low value, were highly appreciated by the class of cultivators the encouragement of whose love of horticultural and agricultural pursuits is the primary object of the holding of these shows, although, perhaps, that appreciation was not fully shared by certain of the judges whose duties required them to adjudicate on the merits of the articles exhibited. The Society has continued its efforts, but without much success, to develop the timber trade of the colony. There are many obstacles in the way of the desired development, among which, to my mind, one of the most important is the lack of knowledge among the woodcutters of the method to be adopted to insure the proper curing of the timber.

I must express my deep regret and disappointment that the year of my office as President has proved such a depressing and disastrous one for the colony at large, and especially for the Sugar Industry, that it should have been one in which any hopes based upon the appointment of the Royal West Indian Commissioners have been overshadowed by the dread shown by the majority of the Commissioners of their fetish—so called “free trade,” and that during it, the interest taken by the Agricultural and Commercial members of the Society has apparently shown signs of waning rather than of increasing.

I trust that in the future far brighter prospects may arise for the Colony than those we at present can perceive, and that those brighter prospects may be in part due to an increased interest in agricultural matters on the part of the members of this Society.

During the period of my office I have been greatly assisted by the kindly advice of the Vice-President, and by the services so willingly and ably rendered by the Honorary Secretary and the Treasurer. Nor must I omit to add my high appreciation of the valuable services so freely given to the Society at large by Mr. Quelch, the Curator of the Museum, and of the constant courtesy shown to me by our able Librarian and Assistant Secretary, Mr. Rodway.

Mr. Gilzean moved a vote of thanks, saying that they wished to take exception to Prof. Harrison's depreciation of himself. He was perfectly certain that the Chair had never been more ably filled, and he was also sure that the President's services had been appreciated by all the members. It was very unfortunate that the attendance at the meetings was so small, but the same thing had been experienced by every President.

Mr. Hargreaves, in seconding, said that he believed the President's tenure of office had been popular, not only with planters but with all classes of Members.

The motion was unanimously carried, and in thanking the meeting the President said his remarks especially referred to Agricultural and Commercial Members.

The President then proposed Mr. R. G. Duncan as President for 1898, which was seconded by Mr. L. M. Hill and carried unanimously.

Prof. Harrison was elected Vice-President and the other Office-Bearers for the ensuing year were also duly elected as per annexed list:—

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*Office-Bearers for 1897.*

**Patroness :**

***THE QUEEN.***

**Vice-Patron :**

**HIS EXCELLENCY SIR AUGUSTUS WILLIAM LAWSON HEMMING,  
K.C.M.G., GOVERNOR AND COMMANDER IN CHIEF, &c., &c., &c.**

***President :***

**R. G. DUNCAN.**

***Vice-President :***

**PROF. J. B. HARRISON, M.A., F.G.S., F.I.C.**

***Hon. Secretary :***

**THOMAS DALY.**

***Hon. Treasurer :***

**F. A. CONYERS.**

***Ordinary Directors :***

**SIR CAVENDISH BOYLE, K.C.M.G.**

**HON. B. H. JONES.**

**JAS. GILLESPIE.**

**E. C. LUARD.**

**REV. W. B. BITCHIE, M.A.**

**HON. A. WEBER.**

***Managing Directors :***

**A. DUNCAN.**

**GEO. GARNETT, F.R.**

**LUKE M. HILL, C.E., A.M.I.C.E.**

***Exchange Room Directors :***

**F. H. ANDERSON, M.D.**

**A. SUMMERSON.**

**C. WIETING.**

**Agricultural Committee :**

*Chairman :*

*Vice-Chairman :*

*Hon. Secretary :*

ROBT. ALLAN  
GEO. BAGOT  
S. M. BELLAIRS  
G. M. BETHUNE  
JACOB CONRAD  
R. G. DUNCAN  
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*Resident Director in London* NEVILLE LUBBOCK.

Mr. A. R. Gilzean gave notice of motion as follows:—

“That, as it is desirable that Agricultural and Live Stock Shows should be held in the Colony, be it resolved

that the Society desires the Agricultural Committee to give the subject its attention."

The thanks of the Society were accorded to Mr. A. J. Patterson for 3 vols. and 1 atlas, Report of U. S. Venezuela-British Guiana Boundary Commission and to Hon. B. Howell Jones for a copy of the Royal W. I. Commission's Report; also for the following donations to the Museum :—

South African minerals (3), Mr. H. I. Perkins; crabs (5), Dr Young; silk moths, Mr. Chas. Ross; variegated crab Mrs. Pringle; abnormal egg, Dr. Matthey; barn owl, Miss Davis; water hemipteron, Mr. J. Thomson; silk moth, Miss Thomson; three bird's eggs, Mr. W. Sharp; swallow's egg, Mr. A. S. Abbot; moth and beetle, Mr. A. Lennox; model of battle, Mr. J. Rodway; alligator and young waterhaas, Mr G. S. Jenman; globe fish, Mr. A. Houston; astræa coral, Mr. G. F. Franks; stone-impliment, Mr. W. N. Sargent; Oberon butterfly, Mr. A. Gordon; horn caterpillar, Mr. F. A. Conyers; silk moth, Miss F. M. King; hairy caterpillar, M. G. Kaufmann; three fossils, Mr. M. F. Juister; Confederate States note, Mr. John Gomes; wood fungus, Mr. Samuel Fraser.

The meeting then terminated.

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